TAKOTNA RIVER SALMON STUDIES AND UPPER KUSKOKWIM RIVER AERIAL SURVEYS, 2002

By

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and

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ABSTRACT

A resistance board weir was operated for a third year on the Takotna River to enumerate annual escapement of returning adult salmon. Total annual escapement included 316 chinook salmon, 4,377 chum salmon, 3,984 coho salmon, 1 sockeye salmon, and 1 pink salmon.

Chinook salmon returns to the Takotna River upstream of the weir in 2002 were the lowest since escapements have been assessed in the stream, but the chum salmon escapement was the second largest on record. Coho salmon escapement for 2002 was 27 fish greater than the previous high of 3,957 fish observed in 2000.

ASL samples were taken from 31% of the chinook salmon escapement, 19% of the chum salmon escapement, and 9% of the coho salmon escapement. Chinook salmon composition included 46% age-6 fish and 33% females. Chum salmon composition included 51% age-5 fish and 45% age-4 fish, and 48% females. Coho salmon composition included 94% age-4 fish and 40% females.

Numbered spaghetti tags, inserted into these fish as part of a mark-recapture project operated on the mainstem Kuskokwim River near Kalskag-Birch Tree Crossing, were observed in 8 of the chum salmon and 52 of the coho salmon that passed Takotna River weir in 2002. Tag numbers were recovered from 6 chum salmon and 50 coho salmon.

Juvenile fish were caught with minnow traps and seines in the Takotna River drainage deployed in the mainstem and in tributary streams at various times from March to December. Captures included 169 juvenile chinook and 181 coho salmon. As in 2000 and 2001, most of the juvenile fish were found in Fourth-of-July Creek and Lower Big Creek, but some juvenile salmon were captured in the mainstem Takotna River above and below the Fourth-of-July Creek confluence.

The weir project served as a platform for conducting two sets of aerial stream surveys, Fourth-of-July Creek continued to be the primary spawning location for chinook and chum salmon. Spawning salmon were distributed throughout the upper Kuskokwim River drainages, but in relatively low densities, except in the Salmon River, where 1,276 chinook salmon were observed and in a clear water side channel of the South Fork Kuskokwim River where 4,150 late spawning chum salmon were observed.

KEY WORDS: Kuskokwim River, spawning, chum salmon, Takotna River, sockeye salmon, chinook salmon, coho salmon, aerial survey, spaghetti tag

INTRODUCTION

The Takotna River is located in the upper Kuskokwim River basin (Figure 1) and produces runs of chinook, chum and coho salmon that contribute to the subsistence and commercial fisheries prosecuted in the Kuskokwim River. Most immediate is the subsistence harvest that occurs near the communities of Takotna and McGrath, where the annual salmon catch ranges up to 1,293 chinook salmon 2,895 chum salmon and 2,780 coho salmon (Burkey et al. 2002). The proportion of Takotna River salmon contributing to this harvest is unknown, but assumed to be relatively high given that the Takotna River and the Takotna River confluence are popular fishing locations (Stokes 1985).

Downstream of the Takotna River, in the mainstem Kuskokwim River, the average annual subsistence harvest of local residents swells to 78,564 chinook, 51,417 chum and 29,450 coho salmon (Burkey et al. 2002). Indeed, the Kuskokwim River supports one of the largest subsistence salmon fisheries in the world and for many of the local residents subsistence fishing is a fundamental component of their culture (Coffing 1991, 1997a, 1997b; Coffing et al. 2000). The lower Kuskokwim River also supports commercial fisheries that have an average annual harvest of 18,081 chinook, 216,406 chum and 453,755 coho salmon past 10 years (Burkey et al. 2002). These commercial fisheries are an important component of the market economy of lower Kuskokwim River communities (Buklis 1999; Burkey et al. 2002). Salmon production from the Takotna River, though modest, contribute to the overall Kuskokwim River salmon harvests both in terms of numbers of fish and in adding to the diversity of salmon spawning populations that support these fisheries.

The value of monitoring salmon escapement to the Takotna River, however, needs to be viewed from a perspective that reaches beyond the modest contributions this one stream makes to salmon harvests. By default the Takotna River project is the only project operated in the entire upper Kuskokwim River basin for monitoring the escapement of chinook, chum and coho salmon (Burkey et al. 2002, Schwanke and Molyneaux 2002). Aerial surveys are periodically flown for indexing chinook salmon abundance in the Salmon River (Pitka Fork drainage), which is another upper Kuskokwim River tributary, but surveys have only been conducted successfully in 6 of the past 10 years. These surveys only index chinook salmon, and the index is based on a single observation made from a fixed winged aircraft (Burkey et al. 2002).

Salmon production in the upper Kuskokwim River supports local subsistence harvests and contributes to the overall ecosystem functioning in the area, but it may also support a disproportionately high fraction of the subsistence harvest in the lower Kuskokwim River, particularly for chinook salmon. Harvest in the lower Kuskokwim River accounts for 76 percent of the total Kuskokwim River chinook salmon subsistence harvest (Burkey et al. 2002), and fishers tend to take that harvest from the early part of the chinook salmon run (Figure 2). On the Yukon River, the early component of the chinook salmon run has been documented to be dominated by upper Yukon River spawning stocks, whereas the contribution of those upper river stocks diminish as the run progresses (Tracy Lingnau, personal communication). If a similar migratory pattern occurs in the Kuskokwim River, upper Kuskokwim River chinook salmon stocks may be providing a disproportionately high fraction of the subsistence harvest taken in the lower Kuskokwim River. Whether the migratory behavior documented on the Yukon River is transferable to the Kuskokwim River is unknown, but that issue may be addressed in the next few years as part of the radio telemetry and genetic stock identification studies currently in development on the Kuskokwim River. Findings of these projects may also better define the utility of the Takotna River salmon escapement-monitoring program as an index of the overall upper Kuskokwim River salmon escapement.

Objectives

1. Determine the daily and total annual chinook, chum and coho salmon escapements to the Takotna River, upstream of the community of Takotna, from 24 June to 20 September.
2. Estimate the age, sex and length (ASL) composition of the total annual chinook, chum and coho salmon escapements to the Takotna River, upstream of the community of Takotna, from a minimum of three pulse samples, one collected from each third of the run, such that 95 percent simultaneous confidence intervals for the age composition in each pulse are no wider than 0.20 ($\alpha = 0.05$ and $d = 0.10$).
3. Recover tag numbers and associated information from chum and coho salmon in support of the mark-recapture study conducted on the mainstem Kuskokwim River.
4. Serve as a monitoring site for chinook salmon equipped with radio transmitters deployed as part of a radiotelemetry study conducted on the mainstem Kuskokwim River.
5. Monitor habitat variables including daily water temperature and daily water level.
6. Determine the distribution of juvenile salmon upstream of the Takotna River weir.
7. Determine the distribution of spawning salmon upstream of the Takotna River weir.
8. Identify locations of spawning salmon aggregates in upper Kuskokwim River drainage tributaries.

Background

Takotna River salmon populations appear to be in a state of recovery following near extirpation earlier in the century (Stokes 1985; Molyneaux et al. 2000). Native Athabaskans, who lived in the upper Kuskokwim River basin before the early twentieth century, harvested salmon from the Takotna River, including residents of *Tagholjitdochak'* which was a village located near the mouth of Fourth-of-July Creek (Hosley 1966; Stokes 1985; Anderson 1977; BLM 1984). Hosley (1966) and Stokes (1983) reported that people from the Vinasale and Tatlawiksuk Athabaskan bands also fished in the Takotna River. The numbers of salmon these people harvested is unknown, but interviews with Nikolai elders recall the existence of fairly strong chinook and chum runs in the Takotna River until the early 1900's (Stokes 1985).

Historically, Native Athabaskans commonly harvested salmon using weirs fitted with fish traps. At least four historical weir sites have been documented on the Takotna River (Stokes 1983). The last of these was abandoned no later than the mid-1920s as reported through oral history and the first hand knowledge of elders from Nikolai. One of these sites was located on the Nixon Fork of the Takotna River, near the confluence of the West Fork River. The other locations included a site on the main river a short distance above the community of Takotna, one near Big Creek (lower), and another near, or within, Fourth-of-July Creek. According to an elder who fished the Nixon Fork weir, these sites were abandoned because the areas' Athabaskan population coalesced around major village sites, and because of the effects of the booming mining industry. Several epidemics also ravaged the area's Native populations in the late nineteenth and early twentieth centuries. For example, between 1908 and 1910, a wave of epidemics, primarily diphtheria, forced the remnant population at *Tagholjitdochak'* to abandon the site (BLM 1984).

Gold was discovered in the Innoko mining district in 1906 and the Takotna River was transformed into a major access route to the gold fields (Brown 1983). The community of Takotna developed as a supply point and staging area for the miners. Dog teams were the primary means of winter transportation and the dried salmon they were fed were likely harvested from the Takotna River and other local streams. Steamboats loaded with tons of mining supplies navigated the Takotna River as far upstream as the current town of Takotna. In the early 1920s small temporary dams were built on the river to facilitate steamboat passage (Kusko Times 1921). At some point, salmon populations became depleted. The timing and cause of the decline are unclear (Stokes 1985), but was likely caused by a combination of over fishing and habitat alteration associated with mining development.

Area residents and local biologists described the Takotna River as being almost void of salmon during the 1960s and 70s (Molyneaux et al. 2000). However, by the 1980s, Takotna residents began to notice adult salmon in the river again. During an aerial survey in 1994 an experienced ADF&G fishery biologist observed several thousand chum and some chinook salmon in Fourth-of-July Creek, a clear water tributary of the Takotna River, but few salmon were observed elsewhere in the Takotna drainage (Burkey and Salomone 1999). In recent years, sport fishers have also begun to catch coho salmon while pike fishing (D. Newton, local resident, Takotna, personal communication).

The perceived increase in salmon abundance prompted the establishment of the escapement-monitoring program on the Takotna River in 1995. A counting tower was used to enumerate fish from 1995 to 1999, but success was limited because of poor water clarity, periodic high water levels and organizational difficulties (Molyneaux et al. 2000). The escapement-monitoring program transitioned from a counting tower to a resistance board weir in 2000, and the change greatly enhanced the success of the program (Schwanke et al. 2001). The weir is operated jointly by the Commercial Fisheries Division of the Alaska Department of Fish and Game (ADF&G) and the Takotna Tribal Council (TTC). Staff from ADF&G help to oversee inseason operations and serve as the principal agent for data management, analysis and report writing. The TTC provides most of the field crew and coordinates much of the preseason preparations and inseason operations.

Historically, few salmon spawning streams within the Kuskokwim River basin have received much attention for rigorous salmon escapement monitoring. The scant escapement data limits the ability of management authorities to assess the adequacy of escapements and the effects of management decisions. Attention to the need for additional escapement monitoring became more critical in September 2000, when the Alaska Board of Fisheries (BOF) classified both Kuskokwim River chinook and chum salmon as "stocks of concern" because of the chronic inability of managers to maintain expected harvest levels (5 AAC 39.222; Burkey et al. 2000a, 2000b, 2002). The Takotna River weir is one of several initiatives started in the late 1990s to help address this data gap in the Kuskokwim River salmon management program.

METHODS

Study Area

The Takotna River originates in the northern half of the mineral rich Kuskokwim Mountains. Formed by the confluence of Moore Creek and Little Waldren Fork, the river flows in a northeasterly direction passing the community of Takotna at river mile (rm) 50, before turning southeasterly near the confluence of the Nixon Fork River at rm 15 (Brown 1983; Figure 1). The Tatalina River joins at rm 3before emptying into the Kuskokwim River across from McGrath at rm 507.

The Takotna River is about 100 miles in length and drains an area of 2,180 square miles (Brown 1983). The river is shallow and winding from its headwaters to the town of Takotna, but gradually becomes deeper downstream of that point, especially after the Nixon Fork confluence. The current is sluggish and the channel width in the lower reaches averages 400 to 500 ft. The river's average slope is about 4.7 feet per mile (Brown 1983).

At normal flow, the river has a nominal load of suspended matter, but the water has a high level of color because of organic leaching. The Nixon Fork and Tatalina Rivers drain extensive bog flats and swampy lowlands, but the remainder of the basin is mostly upland spruce-hardwood forest (Brown 1983, Selkregg *undated*). White spruce with scattered birch and aspen is common on moderate south-facing slopes, black spruce is more characteristic on northern exposures and poorly drained flat areas. The understory consists of spongy moss and low brush on the cool moist slopes, grasses on dry slopes, and willow and alder in the higher open forest near timberline.

Weir Design and Operation

Installation Site

The weir installation site used in 2002 was the same location used in previous years, which was approximately 600 feet upstream of Takotna River Bridge (Schwanke and Molyneaux 2002). This site was about 2 rm upstream from the town of Takotna and 53 rm from the confluence with the Kuskokwim River.

Weir Design

The basic design and materials used in the Takotna River weir in 2002 were the same as those used in 2000 (Schwanke et al. 2001), and included modifications incorporated into the design in 2001 (Schwanke and Molyneaux 2002). The weir spanned a 280-foot channel and consisted of 89 resistance board panels that covered the central 270 ft of the channel. Two 5-foot sections of aluminum fixed panels were placed along the stream margins to accommodate the slope of the bank.

Fish were passed upstream of the weir through one of three passing gates. One of the gates incorporated a fish trap and the other two were constructed from modified resistance board weir panels as described by Schwanke et al. (2001)

A fish resting area was developed immediately upstream of the fish trap in 2002. The resting area was constructed from two five-foot sections of aluminum fixed weir panels attached to either side of the trap exit and extended upstream. The upstream portions of the aluminum weir panels were angled slightly outward and attached to poles driven into the substrate creating a wedge of slower water for fish to reorient themselves after handling.

Weir Maintenance

The weir was usually cleaned after counting shifts. Cleaning was generally accomplished by walking on the panels, which partially submerge them and allowed the current to wash the debris downstream. Periodically, debris had to be removed manually.

Carcasses of dead salmon that accumulated on the weir (hereafter referred to as carcasses) were counted by species and sex before passing the carcasses downstream of the weir.

Typically, the daily cleaning routine included visual inspection of the weir for signs of substrate scouring, broken pickets, or other conditions that could compromise operations. Periodically, the crew also conducted a more thorough inspection by snorkeling along the rail. Problems were attended to immediately. Any points along the substrate rail showing any sign of substrate scouring were addressed with sandbags or comparable means. Damaged weir pickets were repaired using wooden dowels as described by Stewart (2002).

Boat Passage

A section of weir contained modified panels to form a "boat gate" that was used to facilitate boat traffic over the weir. This section was constructed from three modified resistance board panels that had the distal ends covered with a 2 ft X 3 ft (61 cm by 91 cm) sheet of ½ in (1.3 cm) UHMW (Ultra High Molecular Weight) polyethylene plastic attached to the upper surface of the panel. The distal end of pickets and the plastic sheet were bent at about a 30° angle to reduce the angle of contact between the boats and the weir panels, and to protect the pickets from damage. The resistance boards on these panels were adjusted so that the distal ends of the panels dipped close to the water surface. Jet-driven boats could pass both upstream and downstream over these panels with little interruption by simply unlocking the motor's tilt mechanism and driving over the weir. Orange cone pylons were placed on each side of the boat gate as a marker for boat operators and a description of how to pass over the weir was posted at several locations in McGrath.

In years with higher water levels, an additional boat gate was constructed as described by Schwanke and Molyneaux (2002) to accommodate propeller driven boats, but this was not necessary in 2002 because low water levels limited boat travel to jet drive engines.

Counting Schedule

Standard operations included a daily counting schedule of four 2-hour counting periods. This schedule was adjusted as needed to accommodate the migratory behavior of the fish, fish abundance, or operational constrains such as the reduced visibility in the evening during late summer.

Fish Passage

All fish passing upstream of the weir through the passage gates were counted and recorded by species. The only exceptions were fish small enough to freely pass between the weir pickets.

Reporting Salmon Passage

The target operational period for the weir was 24 June to 20 September; however, the actual operations may vary for a given year. In years when the operational period fell short of the target, estimates of the daily salmon passage were made for missed days. In years when the operational period extended beyond the target, the actual daily passage was reported as observed, but the cumulative passage and the percent passage were truncated to conform to the target period of 24 June to 20 September. This convention was instituted to provide for a consistent comparison of escapements between years.

Estimating Missed Salmon Passage

Total annual escapement was determined from the total observed passage counts plus any passage estimates that were made. Passage estimates were made for periods of one or more days when the weir was not operational during the target operational period. The method used to make a passage estimate depended on the circumstances surrounding the inoperable period. A minor breach in the weir may have been disregarded if the problem was remedied quickly and unobserved passage was thought inconsequential. Otherwise, the passage estimate for a single day was calculated as the average of the observed passage one or two days before and one or two days after the inoperable period, minus any observed passage from the inoperable day. Daily passage estimates for inoperable periods lasting two or more days may have been calculated by a linear extrapolation of the average observed passage two days before and after the inoperable period using the following formula:

$$\hat{n}_{d_i} = \alpha + \beta \cdot i - n'_{d_i} \tag{1}$$

$$\alpha = \frac{n_{d_1-1} + n_{d_1-2}}{2}$$

$$\beta = \frac{(n_{d_I+1} + n_{d_I+2}) - (n_{d_1-1} + n_{d_1-2})}{2(I+1)}$$

$$\text{for } (1, 2, \ldots, i, \ldots I)$$

where:

$\hat{n}_{d_i}$ = passage estimate for the i^{th} day (1,2,..i,..I) of a multiple day breach event;

n'_{d_i} = observed passage (if any) from a given day of the inoperable period;

n_{d_I+1} = observed passage the first day after the inoperable period (d_I);

n_{d_I+2} = observed passage the second day after the inoperable period;

n_{d_1-1} = observed passage one day before the inoperable period;

n_{d_1-2} = observed passage two days before the inoperable period;

I = number of days the inoperable period lasted

Downstream Fish Passage

Fish migrating downstream require a safe avenue for passage over the weir. This was especially relevant for longnose suckers. To accommodate downstream passage, several passage chutes were incorporated into the weir design. The chutes were constructed by releasing resistance boards on one or two adjacent weir panels, which allowed the distal ends to dip slightly below the water surface. Low water levels in the Takotna River in 2002 required the placement of sandbags on the weir panels to submerge the distal ends. Sandbags were adjusted to allow downstream migration while minimizing chances of upstream migration. These downstream migrations chutes were positioned in areas where higher concentrations of downstream migrating fish typically occur. These sites were monitored informally to ensure fish were not passing upstream of the weir.

Salmon Age-Sex-Length Composition

ASL composition of the total annual chinook, chum and coho salmon escapements past the weir were estimated by sampling a fraction of the fish passage and applying the ASL composition of those samples to the total escapement. ASL data in this report represents the fish that were successfully aged from scales collected.

ASL Sampling

Crews employed standard sampling techniques as describe in detail by DuBois and Molyneaux (2000) and by Schwnake et al. (2001). A pulse sampling design was used, in which intensive sampling was conducted for one to three days followed by a few days without sampling. The goal of each pulse was to collect samples from 210 chinook, 200 chum and 170 coho salmon. These sample sizes were selected so that the simultaneous 95% confidence interval estimates of age composition proportions would be no wider than 0.20 (Bromaghin 1993). Minimum acceptable number of pulse samples was three per species, one pulse sample from each third of the run.

Salmon were sampled from a fish trap installed in the weir as described by Schwanke et al. (2001). The trap included an entrance gate, holding box and exist gate. The general practice was to open the entrance gate while leaving the exit gate closed, which allowed fish to accumulate inside the 5 ft by 8 ft holding box. The holding box was typically allowed to fill with fish and sampling was done during scheduled counting periods.

Crew members used a dip net to remove fish from the holding pen. Fish were immediately passed to another crew member positioned outside of the holding pen, just upstream of the exit gate. The fish was removed from the dip net and placed into one of two partially submerged fish cradles. One cradle was designed to hold medium sized fish such as chum and coho salmon, while the second cradle was designed to hold larger chinook salmon. Three scales were taken from the preferred area as described in standard procedures (DuBois and Molyneaux 2000). These scales were used to determine the age of the fish. Sex was determined through visual examination of the external morphology, keying on the development of the kype, roundness of the belly and the presence or absence of an ovipositor. Length was measured to the nearest millimeter from mid-eye to the fork of the tail using a straight edged meter stick. After sampling, each fish was immediately released into a resting area upstream of the weir. Scales were placed on gum cards and sampling information recorded on ASL field data forms by a third crew member (Appendix A.1.). This information was later transferred to computer mark-sense forms. The procedure was repeated until the holding pen was emptied.

Additional samples were collected for chinook salmon through active sampling. Active sampling required a technician to be positioned at the downstream end of the trap to observe fish entering the holding pen. When a chinook entered the holding pen the technician would immediately close both the entrance and exit gates, thereby actively trapping the chinook salmon inside the holding box for sampling.

Completed gum cards and data forms were sent to the Bethel or Anchorage ADF&G office for processing.

Estimating ASL Composition of Escapement

ADF&G staff in Bethel and Anchorage aged scales, processed the ASL data, and generated data summaries. DuBois and Molyneaux (2000) describe details of the processing and summarizing procedures. These procedures generated two types of data summary tables for each species, one described the age and sex composition and the other described length statistics. These summaries account for changes in the ASL composition throughout the season by first partitioning the season into temporal strata based on pulse sample dates, then applying the ASL composition of individual pulse samples to the corresponding temporal strata, and finally summing the strata to generate the estimated ASL composition for the season. This procedure ensures that the ASL composition of the total annual escapement is weighted by the abundance of fish in the escapement rather than the abundance of fish in the samples. For example, if samples of chum salmon were collected in six pulses, then the season would be partitioned into six temporal strata with one pulse sample occurring in each stratum. Within each stratum a sample of, for example, 190 chum salmon collected on 27 and 28 June would be used to estimate the ASL composition of the 543 chum salmon escapement that passed the weir during the temporal strata that extended from 23 to 29 June. This procedure would be repeated for each stratum, and the estimated age and sex composition for the total annual escapement would be calculated as the sum of chum salmon in each stratum. In similar fashion, the estimated mean length composition for the total annual escapement would be calculated by weighting the mean lengths in each stratum by the escapement of chum salmon that passed the weir during that stratum.

Ages are reported in the tables using European notation and total age. European notation is composed of two numerals separated by a decimal, where the first numeral indicates the number of winters spent by the juvenile fish in fresh water and the second numeral indicates the number of winters spent in the ocean (Groot and Margolis 1991). Total age of a fish is equal to the sum of these two numerals, plus one to account for the pre-juvenile winter when the egg was incubating in the gravel. Chinook salmon described as an age-1.4 fish under the European notation is actually 6 years of age. European notation can be confusing for non-technical readers, so fish ages are presented in the text of this report as total age.

Mark-Recapture Tag Recovery

Two mark-recapture tagging studies were conducted in the mainstem Kuskokwim River in 2002. The Takotna River weir and other weir projects in the Kuskokwim River drainage were integrated into both studies. In one study, chum and coho salmon were tagged near Kalskag and Birch Tree Crossing in an effort to estimate the total abundance of these species in the Kuskokwim River (Kerkvliet and Hamazaki, *in prep.)*. The Takotna River weir served as one of the tag recovery locations for collecting information on fish that had numbered spaghetti tags attached. The weir crew was responsible for gathering three sets of data associated with this study. First, the crew captured tagged fish in the fish trap and recorded the date of capture, species, tag number, tag color, presence of secondary marks, and the general condition of the fish (Appendix A.2.). The tagged fish were captured in a manner comparable to the active sampling technique described for the ASL sampling of chinook salmon. Visibility was enhanced through the use of a clear-bottom viewing box that reduced glare and water turbulence. Tagged fish were released upstream of the weir with the tag attached.

The second dataset collected in association with the chum and coho salmon mark-recapture study was a daily summary of tagged versus untagged salmon (Appendix A.3.). The design of the mark-recapture study acknowledged that it was unlikely all tagged fish observed would be captured. Tagged fish not captured had their tagged color recorded, and added to the daily tally of captured fish from the first dataset. The clear-bottom viewing box aided visibility.

The third dataset collected in association with the mark-recapture study focused on determining the incidence of tag loss by examining fish for clipped adipose fins (Appendix A.4.). Fish that received numbered spaghetti tags had their adipose fin clipped as a secondary mark. Weir crews examined fish caught in the fish trap for secondary marks. The daily goal was to examine 80 fish of each species, depending on abundance. Sampled populations included all fish caught as part of the ASL sampling, plus additional fish caught solely for purpose of examining for secondary marks.

The second mark-recapture study that involved the Takotna River weir was a radiotelemetry project intended to estimate the total abundance of chinook salmon in the Kuskokwim River (Lisa Stuby, ADF&G Fairbanks, personal communication). Radio transmitters were inserted into chinook salmon caught near Kalskag and Birch Tree Crossing, and one of several radio receiver stations was placed approximately 300 meters downstream from the Takotna River weir to monitor the movement of tagged chinook. The known chinook salmon passage at the weir, coupled with data collected from the receiver station, was used with similar data collected at other weir projects to develop estimates of the total chinook salmon abundance upstream from the tagging site.

Climatological and Hydrological Monitoring

Water and air temperatures were measured at the Takotna River weir each day at approximately 09:00 and 21:00 hours. Temperatures were measured using a calibrated thermometer. Water temperature was determined by submerging the thermometer below the water surface for a few minutes until the temperature reading stabilized. Air temperature was obtained by placing the thermometer in a shaded location until the temperature reading stabilized. These temperature readings were recorded on daily observation forms along with notations about wind direction, estimated wind speed, cloud cover, and precipitation (Appendix A.5.). Daily precipitation was measured using a rain gauge.

Daily operations included monitoring river depth with a standardized staff gauge. The staff gauge consisted of a metal rod driven into the stream channel with a meter stick attached to it. The height of the water surface, as measured from the meter stick, represented the "stage" of the river above an established datum plane. The staff gauge was calibrated to the datum plane by a semi-permanent benchmark, which was installed in 2000 to provide for consistent stage measurements between years (Schwanke et al. 2001). The benchmark consisted of a steel rod driven several feet into the ground near the shoreline, such that only a few inches showed above the surface. The tip of the rods corresponded to stage measurements of 58 cm relative to the datum plane. Water stage was measured at approximately 11:00 and 21:00 hours.

Juvenile Salmon Investigations

Juvenile salmon were captured with minnow traps and beach seines to determine their distribution in the middle and upper reaches of the Takotna River basin. Effort focused on 6 of the 13 geographic zones, or index areas, that included the mainstem of the Takotna River and major tributaries (Figure 3). Periodic trapping and seining took place from March to December on an opportunistic basis.

Minnow traps had ¼ inch mesh and were baited with salmon roe placed loosely in the trap or in small-perforated plastic containers. Traps were fished overnight and information such as soak time, number of fish caught by species, fork length of juvenile salmon, global positioning system (GPS) coordinates and a brief habitat description was recorded.

The beach seines measured 30 ft in length by 4 ft in depth; with a 3/16-inch mesh size. Typical sampling events included several seine hauls from a given segment of stream with each haul moving progressively downstream. Juvenile salmon caught were identified and measured to the nearest millimeter (fork length). All other species were identified and their abundances were estimated. Records were kept of the number of fish by species, GPS coordinates, bank designation and a brief habitat description.

Spawning Salmon Distribution

Aerial surveys were flown over the Takotna River drainage and other selected upper and middle Kuskokwim River tributaries to determine relative abundance and spawning distribution information for chinook, chum, and coho salmon. The chum salmon component includes an early and late spawning population. Surveys were flown on 21 and 22 July, for chinook and early spawning chum salmon, and again from 21 to 23 September for late-spawning chum and coho salmon. Surveys were flown using a contracted pilot flying a Piper PA 18 Super Cub.

Mouth and headwater coordinates for each stream to be surveyed on a given day were given to the pilot to enter into the plane's onboard navigational system (Appendix B.1.). Both coordinates were given so streams could be flown from different directions to compensate for wind, weather, and lighting conditions. The pilot would follow the stream to the best of his abilities while the observer used tally counters to record the numbers of fish. After a stream was surveyed the observer recorded details about the survey in a logbook. These details included information about wind, weather, lighting conditions, water color, water clarity, bottom type, the number of live fish and carcasses by species, fish distribution and movements, occupied and vacant redds, time and distance covered, and vegetation cover. Notes were later transferred to an *Escapement Observations-Kuskokwim Area* form, and submitted for entry into the *Kuskokwim Area Salmon Escapement Observation Catalog* database (e.g., Burkey and Salomone 1999).

RESULTS

Weir Operations

Weir installation began on 19 June and was operational from 1500 hours on 22 June through 20 September 2002, which is within the target operational period of 24 June through 20 September. Weir inspections occasionally revealed small holes that were immediately repaired. No holes were detected that were large enough to pass adult salmon. There were, however, two occasions when open counting gates were accidentally left unattended. The first occasion was on 15 July for eight hours, and the second occasion was on 7 September for three hours.

Fish Passage

Chinook Salmon

Total annual chinook salmon escapement for the target operational period was 316 fish in 2002 (Table 1). No chinook salmon passage was thought missed during the two occasions when the open fish gate was left unattended. Chinook salmon were counted from 24 June to 15 September. Peak daily passage of 93 chinook salmon occurred on 11 July, which was also the median passage date. The central fifty-percent of the passage occurred between 8 and 13 July.

Chum Salmon

Total annual chum salmon escapement for the target operational period was 4,377 fish in 2002 (Table 1), including 20 chum salmon (0.5 %) estimated to have passed the unattended weir. Chum salmon were counted from 23 July to 31 August. Peak passage of 266 chum salmon occurred on 12 July. Median passage point was 10 July and the central fifty-percent of the passage occurred between 3 July and 17 July.

Coho Salmon

Total annual coho salmon escapement for the target operational period was 3,984 fish in 2002 (Table 1). No coho salmon were thought to have passed an open, unattended fish gate. Coho salmon were counted from 30 July to 20 September before the weir was removed. Peak passage of 397 coho salmon occurred on 23 August. Median passage point was 25 August and the central fifty-percent of the passage occurred between 22 August and 1 September.

Other Species

Pink and sockeye salmon are uncommon in the Takotna River, however one male pink salmon was observed passing upstream on 30 July and one male sockeye salmon was seen passing upstream on 21 August (Appendix C.1.4.). Five species of resident fish were observed passing upstream of the weir in 2002. Longnose suckers *Catostomus catostomus* were the most abundant of these resident species with 610 fish passing the weir (Table 1). Other non-salmon species included 19 northern pike *Esox lucius*, 3 whitefish *Coregonus spp*, 3 Artic grayling *Thymallus arcticus*, and 1 burbot *Loda loda*. No estimates were made of resident fish passage for the occasions when the open fish gates were left unattended.

Age-Sex-Length Data

Chinook Salmon

Age was determined for 98 chinook salmon, which accounted for 31.0% of the total annual chinook escapement (Tables 2, 3). The chinook salmon run was partitioned into four strata based on the temporal distribution of the sampling effort. Age-6 fish were predominated and accounted for 45.8% of the total annual escapement. Age-5, -4 and -7 chinook salmon accounted for 31.5%, 21.8% and 0.9% of the total escapement respectively. The percentage of older chinook salmon increased throughout the season.

Female chinook salmon comprised 30% of the annual escapement (Table 2). Young male chinook salmon (age 4) were predominate during the early stages of the run but their proportion diminished as the season progressed (50.0% to 17.6%).

Lengths for female chinook salmon ranged from 600 to 976 mm and ranged from 500 to 875 mm for males (Table 3). Average lengths for females age 4, 5, 6 and 7 were 600 mm, 820 mm, 867 mm and 827 mm, respectively. Average lengths for males age 4, 5 and 6 were 554 mm, 679 mm and 765 mm, respectively. A single male age-5 (age-2.2 European notation) chinook salmon was 560 mm.

Chum Salmon

Age was determined for 824 chum salmon, which accounted for 18.8% of the total estimated annual chum salmon (Tables 4, 5). The samples, collected in six pulses, ranged in size from 200 to 65 fish per pulse, and the run was partitioned into six temporal strata based on the temporal distribution of the sampling effort.

Age-5 and -4 chum salmon accounted for 50.8% and 45.5% of the total annual escapement, and age-6 and -3 fish accounted for 1.2% and 2.5% of the escapement (Table 4). The proportion of older-aged fish (age 5 and 6) was 78.7% early in the run and diminished to 24.8% as the run progressed.

Female chum salmon comprised 47.8% of the total annual chum salmon escapement, and a comparison of the proportion of females between the six strata showed no distinctive trend as the season progressed (Table 4).

Lengths for female chum salmon ranged from 482 to 643 mm and ranged from 506 to 690 mm for males (Table 5). Average lengths for females age 3, 4, 5 and 6 fish were 516 mm, 552 mm, 573 mm and 565 mm, respectively. Average lengths for males age 3, 4, 5 and 6 were 545 mm, 583 mm, 606 mm and 601 mm, respectively. No trends in length variation were observed as the season progressed in 2002.

Coho Salmon

Age was determined for 349 coho salmon that accounted for 9.8% of the total annual coho salmon escapement in 2002 (Tables 6, 7). The samples were collected in three pulses with sample sizes of 136, 128, and 127. The coho salmon escapement was partitioned into three temporal strata based on sampling dates.

Age-4 fish accounted for 94.3% of the total annual escapement and age-3 and -5 fish accounted for 0.2% and 5.5% of the escapement, respectively (Table 6).

Female coho salmon comprised 39.5% of the total annual escapement. The percentage of females increased from 29.3% to 57.1% as the season progressed (Table 6).

Lengths for female coho salmon ranged from 500 to 810 mm, and ranged from 405 to 660 mm for males (Table 7). The average length for females age 3, 4 and 5 were 535 mm, 571 mm and 613 mm, and males age 4 and 5 had average lengths of 545 mm and 546 mm. No trends were seen in average length as the season progressed.

Mark-Recapture Tag Recovery

Eight numbered spaghetti tagged chum salmon were observed passing the Takotna River weir and tag information was recovered for 6 of these fish (Table 8). The 8 tagged chum salmon represent 0.2% of the observed passage of 4,366 fish. Examination for secondary marks was done on 2,245 chum salmon, 51% of the observed passage, and no untagged chum salmon were found to have a secondary mark.

Fifty-two numbered spaghetti tagged coho salmon were observed passing the weir and tag information was recovered for 50 of these fish (Table 8). The 52 tagged coho salmon represent

1.3% of the observed passage of 3,984 fish. Examination for secondary marks was done on 2,338 coho salmon, 57% of the observed passage, and no untagged coho salmon were found to have a secondary mark.

No chinook salmon fitted with radio transmitters passed the weir in 2002; however, one fish was detected approximately one mile downstream from the weir (Lisa Stuby, ADF&G Fairbanks personal communication).

Climatological and Hydrological Conditions

Water temperature ranged from a peak of 17°C on 28 June to a low of 1°C on 20 September (Table 9). Average water temperature at the weir was 10.1°C for the overall operational period.

Water levels ranged from 93.0 cm on 14 September to 37.5 cm on 17 August (Table 9). Water levels in the Takotna River were lower than previous years with an average of 49.8 cm for the overall operational period.

Air temperature at the weir ranged from 22°C on 2 July to -3°C on 20 September and averaged 10.2°C for the overall operational period (Table 9).

Juvenile Investigations

In 2002 an effort was made to trap juvenile salmon throughout the year, starting trapping in March and continuing through December on an opportunistic basis. There were 169 juvenile chinook and 181 juvenile coho salmon captured using traps (Table 10). A single seining event near the mouth of Moore Creek occurred in 2002 and no juvenile salmon were captured. Sampling occurred in 6 of the 13 juvenile sampling index areas as illustrated in Figure 3. Catch data for each index area are listed in Table 10.

A total of 173 baited minnow traps were set with an average soak time of 23 hours. Juvenile chinook and coho salmon were trapped in four of the five index areas and were most abundant in index area 3 (lower Big Creek) and index area 4 (Fourth-of-July Creek). Eight juvenile chinook and 20 juvenile coho salmon were captured in index areas 2 (Takotna River above the weir to Fourth-of-July Creek) and 5 (Takotna River upstream from Fourth-of-July Creek to Big Waldren Fork). Other species captured by trapping included 141 slimy sculpin *Cottus cagnatus*, 70 Artic grayling, and 1 burbot.

A single recorded seining event occurred near the mouth of Moore Creek on 19 September (Table 10). The seine event included 17 sets and a collective catch of 30 whitefish, 16 Artic grayling, 2 longnose suckers, and 2 slimy sculpin. No salmon were captured during this sampling event.

The lengths of juvenile chinook salmon ranged from 48 to 102 mm, and lengths of juvenile coho salmon ranged from 46 to 128 mm (Appendix D.1., D.2.). No fish were aged, but length frequencies suggest that two age classes, (age-1 and age-0) for juvenile chinook salmon and three age classes (age-2, age-1 and age-0) for juvenile coho salmon were captured.

Aerial Surveys

Aerial surveys were conducted on 21 and 22 July, and from 21 to 23 September, to assess the relative abundance and spawning distribution of chinook, chum, late spawning chum and coho salmon in selected tributaries of the middle and upper Kuskokwim River drainage basin (Figure 4). A detailed record of the surveys is provided in Appendix B.2.

Chinook and Chum Salmon

The Takotna River drainage was surveyed on 21 July (Figure 5). Most of the salmon observed were in Fourth-of-July Creek, where 15 chinook, 215 live chum, and 3 chum salmon carcasses were observed. No chinook or chum salmon were observed in Moore, Little Waldren Fork, Big Waldren Fork, Minnie, Bonnie, or lower Big Creeks. A 22 July survey on the mainstem Takotna River from the confluence of the Nixon Fork River to the weir revealed 9 chinook salmon apparently spawning just upstream from the community of Takotna.

Salmon River index areas were surveyed on 21 and 22 July (Figure 6). A total of 1,276 chinook salmon and 1 chum salmon carcass were observed. Index areas 104 and 102 had the highest concentration of chinook salmon with 892 and 359 fish respectively. Index areas 103 and 101 had 21 and 4 chinook salmon respectively. The one chum salmon carcass was observed in index area 101.

Pitka Fork River and its tributaries were surveyed on 22 July (Figure 6). Salmon in the mainstem Pitka Fork River were only observed upstream of the Sheep Creek confluence where 165 chinook salmon were observed. Bear, Sulivan, and Sheep Creeks were also surveyed. Bear Creek had the highest concentration of chinook salmon with 211 fish observed. No salmon were seen in Sulivan Creek and one chinook salmon was observed in Sheep Creek.

Coho Salmon and Late Spawning Chum

An attempt was made on 23 September to survey the Takotna River and its tributaries, but efforts were thwarted by poor weather and turbid water conditions.

The Little Tonzona River was surveyed on 21 September and 64 coho salmon were observed in approximately the first mile of the river upstream of its confluence with the South Fork Kuskokwim River (Figure 7). No late spawning chum salmon were observed in the Little Tonzona River.

A survey conducted on the Tatlawiksuk River on 21 September was limited by weather conditions (Figure 8). There were 12 coho salmon observed in the upper reaches of the stream. No late spawning chum salmon were observed.

George River was surveyed on 21 September, but success was limited because of weather and water conditions (Figure 9). Eight coho salmon were observed in addition to 20 vacant redds. Redds are thought to be those of chinook salmon. No late spawning chum salmon were observed.

The Pitka Fork River and its tributaries were surveyed on 22 September (Figure 6). Coho salmon were observed in the upper Pitka Fork River, Sheep Creek, Sulivan Creek, and the Salmon River. The upper Pitka Fork River had the highest concentration of coho salmon with 149 fish observed. Sheep Creek, Sulivan Creek, and the Salmon River had 28, 4, and 4 coho salmon respectively. Bear Creek was surveyed and no salmon were observed. No late spawning chum salmon were observed in the Pitka Fork River drainage.

The South Fork Kuskokwim River was surveyed on 22 September from a point approximately 10 miles downstream from Fairwell Lake to the confluences of the mainstem Kuskokwim River (Figure 10, 11). Viewing salmon in the mainstem is not possible because of glacier flour suspended in the water, so primarily the surveying effort was focused on clear-water side channels that could be found. There were 4,150 late spawning chum and 15 coho salmon observed in a clear-water side channel located at 62°54.77 N 1540°5.64 W (Figure 10). No other salmon were seen in the South Fork Kuskokwim River.

The mainstem Kuskokwim River was surveyed on 22 September from the confluence of the South Fork Kuskokwim River downstream to the confluence of the Takotna River (Figure 11). The mainstem of the Kuskokwim River is extremely turbid, thus surveying efforts concentrated on finding clear-water, side sloughs and channels, but no clear-water sloughs or channels were found.

Windy Fork, Middle Fork Kuskokwim, and Little Tonzona Rivers were surveyed on 22 September. Suspended glacier flour was prevalent in these rivers, so surveys focused on clear-water side channels and clear water tributaries. Coho salmon were observed in unnamed tributaries of the Windy Fork at 62°43.86 N 154°36.35 W, the Middle Fork Kuskokwim at 62°42.21 N 154°37.73 W and in the Little Tonzona Rivers at 62°57.89 N 154°07.43 W. Coho salmon occurred in the Windy Fork River tributary where 318 fish were observed. Middle Fork Kuskokwim and Little Tonzona River tributaries contained 27 and 3 coho salmon, respectively (Figure 6, 7). No late spawning chum salmon were observed in any of the streams.

DISCUSSION

Weir Operations

Overall, operation of the Takotna River weir in 2002 was a near flawless success. The weir was operational throughout the targeted dates of 24 June through 20 September with the exception of two inconsequential infractions when open gates were left unattended. Fortunately this occurred when fish passage was low. Otherwise, the operations had no note worthy problems.

A modification in weir design in 2002 was a resting area located just upstream of the fish trap and holding pen. This area was used during ASL sampling and proved to be a successful improvement. Before this modification, the fish cradles used for ASL sampling were fastened to the outside of the panels that form the lateral walls of the holding pen, and fish released after sampling often drifted downstream on to the weir, which required rescue, or would swim vigorously downstream over the weir. Moving the sampling area to the upstream end of the holding pen, and incorporating the wing-panels, allowed fish to reorient after handling and essentially ended fish moving downstream after sampling. The benefits of the resting area were especially valuable given the increased handling required by mark-recapture studies being operated in the mainstem Kuskokwim River.

Fish Passage

Chinook Salmon

Abundance. Reported escapement of 316 chinook salmon past the Takotna River weir, during the targeted operational period of 24 June through 20 September, is a reliable estimate of the total annual chinook salmon escapement upstream of the weir in 2002. The influence of 7 hours when the weir was inoperable in July was negligible, and the inoperable period in September was well outside normal chinook salmon passage. The weir was operational for two days before the 24 June target period, and no chinook salmon passage was observed on either day (Table 1).

Escapement of 316 chinook salmon in 2002 was the lowest escapement yet documented for the Takotna River since escapement assessment was first initiated in 1995 (Molyneaux et al. 2000, Schwanke and Molyneaux 2002; Figure 12; Appendix C.1). This low escapement draws some attention because of the designation of Kuskokwim River chinook salmon as a stock of concern by the BOF in September 2000 (Burkey et al. 2000a), and conservation measures enacted since that time. Low chinook salmon escapement seen in the Takotna River in 2002 was not characteristic of the Kuskokwim River in general. Chinook salmon escapements reported at the Kwethluk, Kogrukluk and Tatlawiksuk River weirs all showed improvement in 2002 (Table 11). Improvement was also seen in the 9 streams with comparable data sets where aerial surveys were flown in 2002. Throughout the Kuskokwim River drainage, the only other stream that did not show some improvement in the 2002 chinook salmon escapement was George River.

Chinook salmon escapement to the Takotna River may have been lower but for two conservation measures taken in response to the BOF designating Kuskokwim River chinook salmon as a stock of concern (Burkey et al. 2000a). One of these measures was the closure of the Kuskokwim River commercial salmon fishery in June and July. Consequently, total commercial harvest of chinook salmon was limited to 72 fish in 2002, whereas the 10-year average harvest is 18,081 fish per year (Burkey et al. 2002).

The second conservation measure was the implementation of a subsistence fishing schedule throughout the Kuskokwim River drainage. This schedule was first invoked in 2001 and requires all Kuskokwim River subsistence fishers to remove their nets and stop their fish wheel for three consecutive days each week in accordance with a prearranged schedule. In 2002, however, the schedule was discontinued after 28 June when most run assessment tools suggested the measure was no longer needed. Thereafter, subsistence fishing was allowed seven days a week. Chinook salmon had just begun to arrive into the upper Kuskokwim by 28 June, so any savings from the local impacts of the schedule was probably minimal. Still, the Takotna River and other upper Kuskokwim River tributaries likely benefited from the schedule because the June closures provided windows for fish passage though the subsistence fishery of the lower Kuskokwim River. Unfortunately, the degree of benefit is unknown.

Run Timing. Run timing for Takotna River chinook salmon was earlier and more compact in 2002 than in the previous years of weir operation (Figure 13). Median passage was two days earlier in 2002 than in 2001, and seven days earlier than in 2000. Central fifty-percent passage occurred in six days in 2002, compared to 13 days in 2001 and 19 days in 2000. Coincidentally, beginning dates for the central fifty-percent passage occurred on 8 July in each of the three years the weir operated (Appendix C.1.).

Carcasses. Records were kept regarding the occurrence of chinook salmon carcasses washing downstream onto the weir (Figure 14). Eight carcasses were found, the first observed on 28 June and the last on 20 September. Although the sample size is small, these observations are reassuring in regard to the timing of the aerial surveys flown on 21 and 22 July, which coincided with what was likely near peak abundance of chinook salmon on the spawning grounds.

Index Value. It is thought that the Takotna River weir could provide a measure of escapement that could be applied as an index for the upper Kuskokwim River drainage. The only other escapement monitoring regularly preformed in the upper Kuskokwim River is periodic aerial surveys of the Salmon River (Pitka Fork River drainage), which is a formal escapement index stream (Burkey et al. 2002). Salmon River surveys focus on chinook salmon and are not done every year. To date there are three years with chinook salmon escapement measures from both the Takotna River weir and the Salmon River aerial surveys, these are 2000, 2001 and 2002 (Table 11). Both abundance measures showed an increase from 2000 to 2001, but in 2002 more chinook salmon were seen in the Salmon River survey than would have been suggested based on the Takotna River. The authors recommend managers continue to expand this paired data set to better assess the relationship.

Chum Salmon

Abundance. Reported escapement of 4,377 chum salmon past the Takotna River weir, during the targeted operational period of 24 June through 20 September, is a reliable estimate of the total chum salmon annual escapement upstream of the weir in 2002 (Table 1). The weir was operational two days before the 24 June target period and 9 chum salmon were counted on 23 June. Chum salmon passage occurring before the target operational period is not included in the estimated annual escapement for consistent comparisons between years. Twenty chum salmon estimated to have passed the weir while it was inoperable in July. No chum salmon are believed to have passed the weir in September when no chum salmon passage normally occurs.

Chum salmon escapement of 4,377 in 2002 was the second largest escapement for the Takotna River for which data exists (Schwanke and Molyneaux 2002; Figure 12; Appendix C.2.). The 2002 chum salmon escapement was more than three times the 2000 escapement of 1,254 fish, more than two times the 1997 counting tower estimate of 1,794 and one and a half times the 1996 counting tower estimate of 2,794 (Appendix C. 2.). In 2002, chum salmon escapement fell short of the record 2001 escapement by 1,043 fish. Note, in 1996 and 1997, counting tower operations ended before chum salmon passage was complete. Based on 2000 and 2001 run timing, counting tower passage estimates missed approximately 15% of the chum salmon run in 1996, and about 5% of the run in 1997 (Schwanke and Molyneaux 2002).

Kuskokwim River chum salmon were identified as a stock of concern by the BOF in 2001 (Burkey et al. 2000a), and escapements likely benefited from the consequent closure of the commercial fishery in June and July. The total commercial harvest of chum salmon in the 2002 Kuskokwim River fishery was 1,900 fish, compared to the ten-year average annual commercial harvest of 216,406 chum salmon (Burkey et al. 2002).

The subsistence fishing schedule was discontinued after 28 June and savings from the fishing schedule from local users was likely minimal because most of the run had not yet entered the Takotna River by this date. Still, the Takotna River and other upper Kuskokwim River tributaries likely benefited from the schedule because the June closures provided windows when fish could pass though the subsistence fishery of the lower Kuskokwim River. Unfortunately, the degree of benefit is unknown.

Run Timing. Run timing in 2002 for chum salmon in the Takotna River was the second earliest since escapement data has been collected (Figure 13). Median passage in 2002 was on 10 July and the central fifty-percent of the passage occurred between 3 and 17 July (Appendix C.2.). Median passage in 2002 was 7 days earlier than 2001 and 4 days earlier than 2000. Central fifty-percent passage in 2002 and 2000 occurred in 15 days, compared to 11 days in 2001.

Carcasses. Records were also kept regarding the occurrence of chum salmon carcasses washing downstream to the weir (Figure 14). A total of 183 chum salmon carcasses were found on the weir and most appeared to be in post-spawning condition. Females comprised 33.9% of the carcass count, compared to 47.1% of the upstream migrants. The first carcass appeared on 25 June and the last on 17 August. Fifty-percent of the carcasses were observed by 25 July, while the midpoint of the upstream passage was 10 July. Based on this measure, it took approximately 15 days for chum salmon to complete their life cycle and drift back to the weir. This lag time was the same as 2001, compared to 18 days in 2000 (Schwanke and Molyneaux 2002). An aerial survey of the Takotna River drainage occurred on 21 July and was near the midpoint washout date and likely past the peak spawning abundance in the system.

Coho Salmon

Abundance. Reported escapement of 3,984 coho salmon past the Takotna River weir, during the targeted operational period of 24 June through 20 September, is a reliable estimate of the total annual chum salmon escapement upstream of the weir in 2002 (Table 1). The weir was operational well before the first coho salmon passed and continued operations through the target operational period with the exception of one three hour period that was considered negligible

Coho salmon escapement of 3,984 in 2002 was slightly larger than in 2000 (3,957) and well above the escapement in 2001 (2,606). An estimate of 255 fish was made for missed passage in 2001 of coho salmon before the ending target operational period date of 20 September. (Figure 12; Appendix C.3.).

Kuskokwim River coho salmon have not been identified as a stock of concern. A commercial fishery targeting coho salmon in August harvested 83,463 fish, which is modest compared to the ten-year average annual harvest of 453,755 coho salmon (Burkey et al. 2002). Low harvest was caused in part by a conservative fishing strategy used to accommodate the limited fish processing capacity, but the overall abundance of coho salmon appeared to be relatively low. No conservation measures were taken for coho salmon in the 2002 subsistence fishery.

Run Timing. Run timing of coho salmon in the Takotna River in 2002 was similar to 2000, in both years the median passage date was 25 August. Median passage in 2001 was 23 August and central fifty-percent passage occurred in 10 days in both 2002 and 2000, compared to 9 days in 2001. Central fifty-percent passage began on 22 August in 2002, two days later than 2000 and one day earlier than 2001 (Figure 13, Appendix C.3.). Other than timing, the overall pattern of daily passage was markedly similar between the three years of enumeration data.

Carcasses. Records were kept regarding the occurrence of coho salmon carcasses washing downstream to the weir. No conclusions have been made for coho salmon carcasses because it is likely that the weir was removed before the majority of the fish had completed their life cycle.

Other Species

Passage through the weir by 604 longnose suckers in 2002 was much less than 3,798 and 13,458 longnose suckers seen in 2000 and 2001, respectively. The Tatlawiksuk and George Rivers are the only other monitored tributaries where longnose suckers are the prominent resident species (Appendix C.5.). All three tributaries had fewer longnose suckers observed in 2002 than in 2001, but the difference was most dramatic in the Takotna River where only 4% of what was observed in 2001. The causes of the lower counts remains unknown.

Salmon Age-Sex-Length Composition

Sample size for most ASL pulses collected in 2002 generally fell below the objectives, as was the case in previous years (Schwanke and Molyneaux 2002). Achieving objectives for each pulse sample was weighed against the need for collecting the samples over a brief period of time, abundance of the species available for samples and avoiding undue delay in salmon migration. Chinook salmon were actively captured to increase scale sampling so the data collected could be applied to the total annual escapement.

Chinook Salmon

ASL data collected from chinook salmon was adequate for describing the age composition for the total annual escapement upstream of the Takotna River weir in 2002. The only other year with comparable data for the Takotna River is 2000 when ASL data was applied to the annual escapement (Schwanke et al, 2001). The ASL data in 2001 was not applied to the annual escapement upstream of the weir because the first third of the run was not represented in the ASL sample, therefore only general comparisons can be made from fish sampled during the same time frames (Schwanke and Molyneaux 2002). Age-6 chinook salmon were the dominate component in both 2002 and 2000, comprising 45.8% and 35.6% of the annual escapement As the season progressed, the percentage of age-6 fish increased from 16.7% to 53.8% in 2002 and from 28.0% to 43.8% in 2000 (figure 15). In both years the peak percentage occurred in the third pulse sample. The percentage of age-5 chinook salmon was nearly identical in 2002 and 2001, representing 31.5% and 31.6% of the total annual escapement with one age-5 fish being age 2.2 (European notation) in 2002. Age-4 chinook salmon predominated early portions of the run ranging from 50.0% to 3.8% as the season progressed in 2002. In contrast, in 2000 the percentage of age-4 chinook salmon remained relatively constant throughout the season at about 30%. Overall age-4 fish comprised 21.8% in 2002 and 30.9% in 2000. Other age classes reported in 2002 and 2000 comprised a minor percentage of the annual escapement with age-7 fish comprising 0.9% of the run in 2002 and age-3 and -7 fish comprising 2.0% in 2000. The age composition of chinook salmon sampled in 2001 had a higher percentage of older-aged fish than the samples from 2002 or 2000 (Appendix E.1.). In 2001 fish age 4, 5, 6, and 7 comprised 10.5%, 25.6%, 61.6%, and 2.3% of the total fish sampled.

Chinook salmon sampled from the Takotna River in 2002 had a modestly higher percentage of females than was observed in 2000 (Figure 16, Appendix E.1.). Females accounted for 30.0% of the total annual chinook escapement in 2002, compared to 24.5% in 2000 (Schwanke et al. 2001). These finding are not surprising when considered in context with the higher percentage of older-aged fish seen in 2002, because older age classes of chinook salmon tend to have a higher incidence of females than younger age classes (DuBois and Molyneaux 2000). In 2001, females accounted for 39.5% of the fish sampled, but no samples were collected from the first third of the run (Schwanke and Molyneaux 2002, Appendix E.1.). This is consistent with an increase in the female percentage occurring during the central two sampling pulses in 2002 and 2000.

Mean lengths for female age-5 and -6 chinook salmon in 2002 was greater than that observed in 2000 (Appendix E.2.). Female age-5 and -6 chinook salmon had a mean length of 820 and 867 mm in 2002, compared to 774 and 818 mm for the same sex and age class in 2000. This increase in length from 2000 to 2002 was nearly identical with age-5 fish increasing by 46 mm and age-6 fish increasing by 49 mm. Mean length for male chinook salmon increased by 8 mm for age-5 fish and decreased by 5 mm for age-6 fish when comparing 2002 to 2000 data. The mean length of male age-4 chinook salmon did increased in 2002 compared to 2000 from 501 to 554 mm.

Observed increases in average length of female chinook and male age-4 chinook could be attributed to the influence of the subsistence fishing schedule, which was invoked in 2002, but not in 2000; however, a comparable increase in mean length was not observed in male age-5 and –6 chinook salmon as would be expected. Alternatively, the female chinook and male age-4 fish may simply have been composed of larger fish in 2002.

Chum Salmon

ASL data collected from chum salmon was adequate for describing the age composition for the total annual escapement upstream of the Takotna River weir in 2002. In addition, the subsistence fishing schedule likely had less influence on the ASL composition of chum salmon than was discussed for the chinook salmon, because subsistence fishers tend to use larger mesh nets, "king gear," which does not entangle most chum salmon.

Older chum salmon, age-5 and –6 fish, were prominent early in the run and diminished as the season progressed, with younger, age-3 and –4 fish becoming prominent (Appendix E.3; Figure 15). This trend was observed in 2000 and 2001, which are the only other years in which ASL data is available for Takotna River chum salmon (Schwanke and Molyneaux 2002). This same pattern has been commonly observed at other escapement monitoring projects (DuBois and Molyneaux 2000).

Age-3 chum salmon typically compose a small percentage of the annual return (DuBois and Molyneaux 2000). Still, the relatively large number (41) age-3 chum salmon observed in 2002 is of particular interest because it may be an indication of a strong cohort from the 1999 brood year and foretell of a strong chum salmon run in 2003 when the dominant age-4 fish will return (Appendix E.3.). In a comparable situation, 33 age-3 fish were observed in 2000 and in 2001 that same cohort produced 4,068 age-4 fish, which was 75.1% of the total annual escapement that year. Overall, the 2001 chum salmon escapement was the largest yet recorded for the Takotna River. Missing from this assessment is the number of Takotna River chum salmon that may have been removed through harvest; however, the commercial chum salmon harvest in 2000, 2001, and 2002 was negligible, and the subsistence harvest in each of these years was nearly identical (Burkey et al. 2002).

Percentages of female chum salmon in 2000, 2001, and 2002 were similar at 57.7%, 50.3%, and 55.7%, respectively (Appendix E.3; Figure 16). These percentages are similar to what is found at most other escapement projects in the Kuskokwim River Drainage (DuBois and Molyneaux 2000).

DuBois and Molyneaux (2000) report that the within season percentage of females generally increases over the duration of the run; however, that pattern was not observed at Takotna River weir in 2002, instead the percentage of females varied between 40.9% and 54.2% with no obvious pattern. Results in 2000 were similar with females varying between 52.9% and 65.2%. In 2001the more typical pattern described by DuBois and Molyneaux (2000) did occur at the Takotna River weir with the percentage of females building from 32.4% at the start of the season, to 72.2% at the end of the season. The reason for the inconsistency between years is unknown.

Mean lengths of chum salmon by sex and age class in 2002 were generally larger than fish sampled in 2001 or 2000, but for age-4 and –5 fish the increase was less than 10 mm and may not be significant (Appendix E.4.).

Coho Salmon

ASL data collected from coho salmon was adequate for describing the age composition for the total annual escapement upstream of the Takotna River weir in 2002. Age composition of coho salmon in the Takotna River included age-3, -4, and -5 fish (Table 7). The run, however, was dominated by the age-4 fish, which accounted for 94.3% of the total annual escapement. In 2001 and 2000 the same age class was dominant and accounted for 87.9% and 97.7% of the annual escapements respectively (Appendix E.5.). The dominance of age-4 coho salmon is typical of the Kuskokwim River in general (DuBois and Molyneaux 2000).

Female coho salmon accounted for 39.5% of the total annual escapement in 2002 and was the lowest percentage yet observed at the project (Appendix E.5.). In 2001, females accounted for 42.4% of the escapement and in 2000 females made up 50.9% of the annual escapement. The relatively low percentage could be an artifact of crew misidentification of sex. DuBois and Molyneaux (2000) identified erroneous sex identification as being a persistent problem with coho salmon. The potential of erroneous sexing at the Takotna River weir project needs to be addressed in future years by emphasizing diligence in sexing fish.

During each of the years scale sampling has occurred, percentages of female coho salmon has increased slightly as the run progressed (Figure 16).

Mean length for coho salmon has varied in the three years that length data has been collected. Female age-4 coho salmon have ranged from 572 mm in 2001 to 547 mm in 2000. Male age-4 coho salmon have ranged from 563 mm in 2001 to 540 mm in 2000. The largest mean length for coho salmon occurred in female age-5 fish, in 2002, with a length of 613 mm. The smallest mean length was in female age-3 coho salmon, in 2002, with a length of 535 mm. No obvious trends were observed in mean lengths as the run progressed (Appendix E.6.).

Mark-Recapture Tag Recovery

Chum Salmon

Eight tagged chum salmon were observed passing the Takotna River weir and observed during the central fifty-percent of the run (Figure 17). Information from 6 recovered tags indicates they were tagged during the first 10% of the chum salmon run caught at the Kalskag and Birch Tree Crossing tagging sites (Figure 18). The sample size is small, but these findings indicate chum salmon migrating to the Takotna River occur early in the overall Kuskokwim River chum run. This same tendency may be true of other upper Kuskokwim River tributaries as well.

Tag numbers recovered from 6 of the 8 tagged chum salmon established the transit time from Kalskag and Birch Tree Crossing to the weir was from 14 to 18 days with a migration speed from 20 to 26 miles per day (Appendix F.1.).

Percentage of tagged fish in the total annual chum salmon escapement for the Takotna River weir was relatively small compared to the percentage observed at the other monitored tributaries, which included the George and Tatlawiksuk Rivers (Carol Kerkvliet, ADF&G Anchorage, personal communication). The lower incidence of tagged chum salmon in the Takotna River indicates this spawning aggregate had a lower probability of capture at the tagging site than did chum salmon from the other tributaries. Details about the 2002 tagging project will be discussed by Kerkvliet and Hamazaki (*in progress*); however, note chum salmon were being caught at the Kalskag-Birch Tree Crossing tagging site on the first day of operation (14 June at Birch Tree Crossing and on 18 June at Kalskag), and a few days were needed to get the project fully operational (Appendix F.2, F.3.). The limited number of available tags indicates the Takotna River fish were more prominent during the start up phase when tagging effort was not yet at full capacity. In addition, water levels in the mainstem Kuskokwim River were higher in the early part of the season and may have had the result of making the fish wheels less efficient in catching fish during the early portion of the overall Kuskokwim River chum salmon run (Dave Folletti, ADF&G Anchorage, personal communication).

Of the 2,245 chum salmon examined for secondary marks, no untagged fish were found to have a secondary mark. The conclusion from this finding is that tag loss was not occurring.

Coho Salmon

Fifty-two tagged coho salmon were observed at the Takotna River weir, but the run timing of the tagged fish was later than the run timing of the overall escapement (Figure 17). This lag in run timing for tagged fish is assumed to be associated with recovery time required following the handling occurring during tagging. Details about the 2002 tagging project will be discussed by Kerkvliet and Hamazaki (*in progress*).

Tag numbers were recovered from 50 of the 52 tagged coho salmon that passed the weir (Appendix F.1.). Transit time from Kalskag-Birch Tree Crossing to the weir ranged from 12 to 35 days with an average travel time from of 21 days. Migration speed from the tagging sites to the Takotna River weir ranged from 10 to 29 miles per day, and averaged 18 miles per days. The migration speed tended to increase as the season progressed. Because of the proximity of the tagging sites and close agreement in transit time to the weir, the tag data from Kalskag and Birch Tree Crossing was pooled.

Information from the 50 recovered tags indicate Takotna River coho salmon passed through the Kalskag-Birch Tree Crossing tagging site during the early part of the overall Kuskokwim River coho run, although not as early as was found for chum salmon (Figure 19; Appendix F.2, F.3.). The midpoint for coho salmon captured at the tagging sites was 19 August, but by that date 84% of the Takotna River bound coho salmon had already been tagged. These findings indicate coho salmon migrating to the Takotna River occur early in the overall Kuskokwim River coho run. This same tendency may be true of other upper Kuskokwim River tributaries.

Of the 2,338 coho salmon examined for secondary marks, no untagged fish were found to have a secondary mark. The conclusion from this finding is that tag loss was not occurring.

Climatological and Hydrological Monitoring

Water levels in the Takotna River were below average throughout most of the operational period (Figure 20). The weir experienced one high water event on 13 September that crested at 93 cm. The weir remained operational throughout this event. Water level in the Takotna River in 2002 seemed to have little affect on the migration of chinook and chum salmon (Figure 21). An increase in water level on 24 August was mirrored by increase in coho salmon passage. This behavior for coho salmon has been observed in other stocks throughout their range (Sandercock 1991).

Reported water temperature of the Takotna River ranged from 2°C to 17.5°C during the 2002 project operations that was consistent with the 2000 range of 2°C to 20°C and more variable than the 2001 range of 6°C to 18°C (Schwanke and Molyneaux 2002). Average water temperature of 10.1°C in 2002 was lower than in 2000 or 2001 (11.2°C and 12.5°C). Cooler water temperatures observed in 2002, coupled with associated climatic conditions, appeared to help moderate the growth of filamentous algae in the river compared to what was observed in 2000 (Schwanke et al, 2001). In 2000 the algae accumulated en masse on the weir pickets, which added to the burden weir cleaning.

In 2002 the fluctuations observed in daily water temperatures did not appear to affect salmon passage (Figure 22).

Juvenile Salmon Investigations

Juvenile salmon investigations were conducted for the third consecutive year in the Takotna River basin. Efforts in 2002 were expanded to include trapping from March to December. Low water levels during the summer months limited access to tributaries upstream of Fourth-of-July Creek, consequently, most sampling effort concentrated on trapping events in Fourth-of-July Creek (Index Area 4), Lower Big Creek (Index Area 3) and in the mainstem Takotna River downstream from Fourth-of-July Creek (Index Area 2) (Table 10; Figure 3). The upper Takotna River basin was only accessed in September when Big Waldren Fork was trapped on 5 September and Moore Creek was sampled using a seine on 19 September. No juvenile salmon were captured in either Big Waldren Fork or Moore Creek. Overall, the juvenile salmon investigations conducted in 2002 provided no new distribution information over what was determined in 2000 and 2001.

Juvenile Chinook Salmon

All of the 169 juvenile chinook salmon caught in 2002 were captured in Fourth-of-July Creek (Index Area 4), or locations downstream of Fourth-of-July Creek, except four fish captured in the mainstem Takotna River slightly upstream from the confluence with Fourth-of-July Creek (Index Area 5) (Table 10; Figure 3; Appendix D.1.). As was reported by Schwanke and Molyneaux (2002), efforts should be made to sample for juvenile salmon in the upper Takotna River basin as early as possible to recognize the possibility of juvenile emigration.

Length data collected from juvenile chinook salmon is reported in Appendix D.1. Figure 23 illustrates the length distribution by month with some speculation as to the age compositions.

Juvenile Coho Salmon

All coho salmon sampled in 2002 were captured using traps. Most of the 181 coho salmon trapped in 2002 came from lower Big Creek (index area 3) and represented 74% of the juveniles captured and sampled in 2002. Fourth-of-July Creek (index area 4) had the second largest proportion at 15%, with the mainstem Takotna River above and below the confluence of Fourth-of-July Creek (index areas 2 and 5) representing 7% and 4% respectively.

Length data collected from juvenile coho salmon is reported in Appendix D.2. Figure 24 illustrates the length distribution with some speculation as to the age compositions. Because of small sample sizes in some of the trapping events the data was pooled into categories defined as spring (March and April), summer (June to September) and fall (October through December).

Spawning Salmon Distribution

Many upper Kuskokwim River tributaries were difficult to survey because of water color, meandering stream channels, and dense overhanging riparian vegetation (Appendix B.2.). Low water conditions and fair weather were conducive to conducting aerial surveys in July, but high water and inclement weather hampered efforts in September.

Takotna River

Chinook and Chum Salmon. Timing of aerial surveys in the Takotna River drainage on 21 July corresponded well to the period of peak abundance on the spawning grounds with the cumulative salmon passage at the weir of 84% for chinook and 85% for chum salmon (Table 1). Carcass counts at the weir had increase to 25% for chinook and 40% for chum salmon by 21 July (Table 14). Still, the fish observed during the aerial surveys only account for 5.6% and 5.7% of the cumulative chinook and chum salmon escapement through that date.

Fourth-of-July Creek remained the dominant system for spawning salmon in the drainage (Figure 5); however, 2002 differed from previous years in that chinook salmon were observed spawning in the mainstem below the weir site. Nine chinook salmon were observed on four separate redds located between the community of Takotna and the weir. Chum salmon were observed only in Fourth-of-July Creek, which is similar to the finding in 2001 and 2000 (Schwanke et al. 2001 and 2002). In 2001, however, one chum salmon was seen in the mainstem Takotna River just above the confluence of Big Waldren Fork. These findings are also consistent with observations made in 1996 when 100% of the chinook salmon and 99% of the chum salmon were observed in Fourth-of-July Creek.

Coho Salmon. Poor weather conditions in September thwarted efforts to conduct aerial surveys of the Takotna River.

Other Middle and Upper Kuskokwim River Tributaries

Chinook and Chum Salmon. July aerial surveys in 2002 concentrated on the Pitka Fork River and its tributaries. Conditions were conducive to conducting aerial surveys because of low water conditions in the area and clear skies.

The Salmon River continued to be the main spawning system for chinook salmon in the Pitka Fork River drainage. The Salmon River index area has been surveyed 20 times between 1975 and 2000, all focusing on chinook salmon (Burkey and Salomone 1999). Counts in previous years ranged from 272 to 2,555 salmon. The 2002 aerial survey count was 1,276 chinook salmon, just under the escapement goal of 1,300 fish.

Interest exists in renewing a weir project on the Salmon River to enumerate chinook salmon escapement, however the project would be of limited use. Aerial survey data indicates the Salmon River is an important spawning area for chinook salmon in the upper Kuskokwim River drainage but its use by other salmon species was negligible. A weir was operated on the South Fork Salmon River in 1981 and 1982, but the passage was primarily limited to chinook salmon (Schneiderhan 1981 and 1982).

Bear Creek had the next highest concentration of chinook salmon in the Pitka Fork River drainage with 211 fish. Bear Creek has been surveyed nine times beginning in 1975 with chinook salmon counts ranging from 242 (1978) to 3 (1987) (Burkey and Salomone 1999). The chinook salmon abundance observed in Bear Creek in 2002 was the second only to 1978.

Sullivan Creek and Sheep Creek are also tributaries of the Pitka Fork River, but few chinook salmon have been observed spawning in these streams. Sullivan Creek was surveyed in 1976, 2001, and 2002 with a total of 25 chinook salmon counted for the three years combined. Sheep Creek was surveyed in 2001 and 2002 had a combined chinook salmon total of five fish.

Within the mainstem Pitka Fork River, 165 chinook salmon were observed in 2002 upstream of the Sheep Creek confluence. No chinook salmon were observed in this section of the river surveyed in 2001 (Schwanke and Molyneaux 2002). In 2000, the mainstem Pitka Fork was surveyed downstream from the confluence with Sheep Creek and 151 chinook salmon were observed (Schwanke et al 2001). In 2002, no salmon were seen in the limited survey conducted downstream from the Sheep Creek confluence.

Historically, 48 aerial surveys have been conducted collectively on the mainstem Pitka Fork River, Salmon River, Bear Creek, Sullivan Creek, and Sheep Creek to assess chinook and early spawning chum salmon escapements (Burkey and Salomone 1999; Schwanke and Molyneaux 2002). Since the first survey in July 1975, early chum salmon were observed in only five of these surveys. These five observations of early spawning chum salmon occurred in the mainstem Pitka Fork River and in the Salmon River. The abundance of early spawning chum salmon has been 50 fish or fewer in the five surveys that chum salmon were observed. Results from the weir operated on the Salmon River in 1981 and 1982 documented counts of 8 and 39 chum salmon respectively (Schneiderhan 1981 and 1982). Aerial surveys conducted in those years reported no chum salmon, although the 1981 survey was rated as poor (Burkey and Salomone 1999). In the Salmon River, 997 early spawning chum salmon were reported in 1997, however, the speciation of this survey may be suspect because of poor surveying conditions and observer inexperience.

Aerial survey data indicates the Pitka Fork and its tributaries are not utilized by early spawning chum salmon. Early spawning chum salmon may occur in the Pitka Fork River downstream from its confluence with Sullivan Creek undetected because the water clarity of the mainstem Pitka Fork River is marginal for aerial surveys in most years below this point.

Coho and Late Spawning Chum Salmon. September aerial surveys concentrated on middle and upper Kuskokwim River tributaries. The middle Kuskokwim River tributaries included the George and Tatlawiksuk Rivers. Upper Kuskokwim River tributaries surveyed included the Pitka Fork, South Fork, Middle Fork, and Windy Rivers. Inclement weather hampered aerial surveys on occasion.

The Tatlawiksuk River was surveyed for coho salmon with the intention of contributing a paired data set complimenting the salmon escapement monitoring done with a weir; however, efforts were thwarted by poor weather and unfavorable water conditions.

The George River was surveyed for coho salmon with the intention of contributing a paired data set complimenting the salmon escapement monitoring done with a weir, but efforts were thwarted by poor weather and unfavorable water conditions.

The Pitka Fork River and its tributaries were surveyed in 2002. Collectively, 36 coho salmon were observed in tributaries of the Pitka Fork River, which included the Salmon River, Bear Creek, Sullivan Creek- and Sheep Creek. In addition, 149 coho salmon were observed in the mainstem Pitka Fork River upstream from its confluence with Sheep Creek, in an area that was not surveyed in 2001 (Schwanke and Molyneaux 2002).

The history of aerial surveys in the Pitka Fork River drainage indicates the major spawning populations occur in the mainstem, upstream of the Sheep Creek confluence. Historically, few spawning coho salmon have been observed in the lower sections of the Pitka Fork River or its tributaries (Burkey and Salomone 1999).

The Little Tonzona River, which is a tributary of he South Fork Kuskokwim River, and one of its unnamed tributaries was surveyed in 2002 and 64 coho salmon were observed from the mouth of the Little Tonzona River upstream to the confluence of the unnamed tributary at 62°57.89 N 154°07.43 W. Most of these fish were in a single group of 50 fish seen near the mouth of the Little Tonzona River. In contrast only three coho salmon were observed in the surveyed sections of the unnamed tributary. Surveys of this same tributary were conducted in 1996, 2000 and 2001 and the observers reported 0, 900 and 208 coho salmon respectively (Schwanke and Molyneaux 2002).

Clear-water, side channels on the South Fork Kuskokwim River were surveyed in three previous years (Schwanke and Molyneaux 2002). One of these side channels was found to contain populations of late spawning chum and coho salmon in 2002. The approximately three-mile clear-water side channel had 4,150 late spawning chum and 15 coho salmon. The abundance of late spawning chum salmon in this clear water, side channel was much greater in 2002 than in the previous years of aerial surveys of the area. In 1996, 2000, and 2001 there were 375, 50 and 480 late spawning chum salmon, respectively (Burkey and Salomone 1999; Schwanke and

Molyneaux 2002). The abundance of coho salmon in this clear water, side channel decreased compared to 2000 and 2001 when there were 300 and 134 fish counted respectively. The 1996 aerial survey of the area recorded no coho salmon in this clear water, side channel. Late spawning chum salmon were not found in other locations surveyed in the South Fork Kuskokwim River.

Within the Middle Fork and Windy Fork Rivers, unnamed clear water tributaries were surveyed for the second consecutive year (Schwanke and Molyneaux 2002). In 2002, 27 coho salmon were observed in the unnamed tributary of the Middle Fork River, whereas, no salmon were encountered in that stream in 2001. The unnamed tributary of the Windy Fork River contained populations of adult coho salmon in each of the three years the system was surveyed (1996, 2001 and 2002).

LITERATURE CITED

Anderson, E.F. 1977. Report on the cultural resources of the Doyon Region, central Alaska, Volume 1. Anthropology and Historic Preservation Cooperative Park Studies Unit, University of Alaska-Fairbanks, Occasional Paper No. 5. Fairbanks.

Bromaghin, J.F. 1993. Sample size determination for interval estimation of multinomial probabilities. The American Statician. 47(3): 203-206.

Brown, C.M. 1983. Alaska's Kuskokwim River region: a history. Bureau of Land Management, Anchorage.

Buklis, L.S. 1999. A description of economic changes in commercial salmon fisheries in a region of mixed subsistence and market economies. Arctic. 52 (1): 40-48

Bureau of Land Management (BLM). 1984. Mouth of Fourth of July Creek, Doyon, Limited BLM#AA-12368. (site selection for registry as a historical place).

Burkey, C. Jr., and P. Salomone. 1999. Kuskokwim Area salmon escapement observation catalog, 1984 through 1998. Alaska Department of Fish and Game, Commercial Fisheries Division, Regional Information Report 3A99-11, Anchorage.

Burkey, C. Jr., M. Coffing, D.B. Molyneaux, and P. Salomone. 2000a. Kuskokwim River chinook salmon stock status and development of management/action plan options. Alaska Department of Fish and Game, Commercial Fisheries Division, Regional Information Report 3A00-40, Anchorage.

Burkey, C. Jr., M. Coffing, D.B. Molyneaux, and P. Salomone. 2000b. Kuskokwim River chum salmon stock status and development of management/action plan options. Alaska Department of Fish and Game, Commercial Fisheries Division, Regional Information Report 3A00-441, Anchorage.

Burkey, C. Jr., M. Coffing, J. Menard, D.B. Molyneaux, P. Salomone, and C. Utermohle. 2001. Annual management report for the subsistence and commercial fisheries of the Kuskokwim area, 2000. Alaska Department of Fish and Game, Commercial Fisheries Division, Regional Information Report 3A01-34, Anchorage.

Burkey, C. Jr., M. Coffing, J. Estensen, R. L. Fisher, and D.B. Molyneaux. 2002. Annual management report for the subsistence and commercial fisheries of the Kuskokwim area, 2001. Alaska Department of Fish and Game, Commercial Fisheries Division, Regional Information Report 3A02-53, Anchorage.

Coffing, M. 1991. Kwethluk subsistence: contemporary land use patterns, wild resource harvest and use, and the subsistence economy of a lower Kuskokwim River area community. Alaska Department of Fish and Game, Subsistence Division, (Region III unpublished report), Bethel.

Coffing, M. 1997a. Kuskokwim area subsistence salmon harvest summary, 1996; prepared for the Alaska Board of Fisheries, Fairbanks, Alaska, December 2, 1997. Alaska Department of Fish and Game, Subsistence Division, (Region III unpublished report), Bethel.

Coffing, M. 1997b. Kuskokwim area subsistence salmon fishery; prepared for the Alaska Board of Fisheries, Fairbanks, Alaska, December 2, 1997. Alaska Department of Fish and Game, Subsistence Division, (Region III unpublished report), Bethel.

Coffing, M., L. Brown, G. Jennings, and C. Uttermole. 2000. The subsistence harvest and use of wild resources in Akiachak, Alaska, 1998. Final Project Report to U.S. Fish and Wildlife Service, Office of Subsistence Management, FIS 00-009, Juneau.

DuBois, L. and D.B. Molyneaux. 2000. Salmon age, sex and length catalog for the Kuskokwim area, 1999 Progress Report. Alaska Dept. of Fish and Game, Commercial Fisheries Division. Regional Informational Report 3A00-18, Anchorage.

Groot, C. and L. Margolis (eds.). 1991. Pacific salmon life histories. University of British Columbia Press, Vancouver, British Columbia, Canada.

Hosley, E. 1966. The Kolchan: Athabaskans of the Upper Kuskokwim. Manuscript. University of Alaska, Fairbanks. 148 pp.

Kusko Times. 1921. (no title) August 13, 1921, volume 1, No. 58.

Molyneaux, D.B., L. DuBois, B. Mwary, and J. Newton. 2000. Takotna River counting tower, project summary, 1995-1999. Alaska Department of Fish and Game, Commercial Fisheries Division, Regional Informational Report 3A00-13, Anchorage.

Sandercock, F. K. 1991. Life history of coho salmon (*Oncorhynchus kisutch*). Pages 395-446 in C Groot and L Margolis, editors. Pacific salmon life histories. University of British Columbia Press, Vancouver, British Columbia, Canada.

Schneiderhan, D.J. 1982a. 1981 Salmon River weir studies. Alaska Department of Fish and Game, Commercial Fisheries Division, AYK Region, Kuskokwim Escapement Report Number 21. Anchorage.

Schneiderhan, D.J. 1982b. 1982 Salmon River weir studies. Alaska Department of Fish and Game, Commercial Fisheries Division, AYK Region, Kuskokwim Escapement Report Number 29. Anchorage.

Schwanke, C.J., D.B. Molyneaux, L. DuBois, and C. Goods. 2001. Takotna River salmon studies and upper Kuskokwim River aerial surveys, 2000. Alaska Department of Fish and Game, Commercial Fisheries Division, Regional Information Report 3A01-02, Anchorage.

Schwanke, C.J., and D.B. Molyneaux. 2002. Takotna River salmon studies and upper Kuskokwim River aerial surveys, 2001. Alaska Department of Fish and Game, Commercial Fisheries Division, Regional Information Report 3A02-09, Anchorage.

Selkregg, L.L. (ed). *Undated.* Alaska regional profiles, southwest region. University of Alaska, Arctic Environmental Information and Date Center. Fairbanks, Alaska.

Stewart, R., 2002. Resistance board weir panel construction manual 2002. Alaska Department of Fish and Game, Commercial Fisheries Division, Regional Information Report 3A02-21, Anchorage.

Stokes, J. 1983. Subsistence salmon fishing in the upper Kuskokwim River system, 1981 and 1982. Alaska Department of Fish and Game, Subsistence Division, Technical Paper No. 23, Juneau.

Stokes, J. 1985. Natural resource utilization of four upper Kuskokwim communities. Alaska Department of Fish and Game, Subsistence Division, Technical Paper No. 86, Juneau.

Tables

Table 1. Daily, cumulative and percent passage for chinook, chum and coho salmon and longnose suckers at the Takotna River weir, 2002.

Date	Chinook Salmon			Chum Salmon			Coho Salmon			Longnose Sucker		
	Daily	Cumulative	Percent Passage	Daily	Cumulative	Percent Passage	Daily	Cumulative	Percent Passage	Daily	Cumulative	Percent Passage
23-Jun	d 0	0	0	9	0	0	0	0	0	0	0	0
24-Jun	1	1	0	29	29	1	0	0	0	3	3	0
25-Jun	0	1	0	55	84	2	0	0	0	1	4	1
26-Jun	0	1	0	55	139	3	0	0	0	7	11	2
27-Jun	2	3	1	111	250	6	0	0	0	2	13	2
28-Jun	4	7	2	116	366	8	0	0	0	21	34	6
29-Jun	3	10	3	168	534	12	0	0	0	3	37	6
30-Jun	1	11	3	147	681	16	0	0	0	19	56	9
1-Jul	5	16	5	180	861	20	0	0	0	11	67	11
2-Jul	0	16	5	72	933	21	0	0	0	0	67	11
3-Jul	1	17	5	145	1,078	25	0	0	0	0	67	11
4-Jul	2	19	6	94	1,172	27	0	0	0	0	67	11
5-Jul	3	22	7	250	1,422	32	0	0	0	8	75	12
6-Jul	11	33	10	204	1,626	37	0	0	0	1	76	12
7-Jul	17	50	16	251	1,877	43	0	0	0	4	80	13
8-Jul	32	82	26	124	2,001	46	0	0	0	5	85	14
9-Jul	7	89	28	110	2,111	48	0	0	0	2	87	14
10-Jul	2	91	29	205	2,316	53	0	0	0	0	87	14
11-Jul	93	184	58	259	2,575	59	0	0	0	96	183	30
12-Jul	51	235	74	266	2,841	65	0	0	0	75	258	42
13-Jul	2	237	75	80	2,921	67	0	0	0	15	273	45
14-Jul	2	239	76	103	3,024	69	0	0	0	1	274	45
15-Jul	2 e	241	76	97 a	3,121	71	0 e	0	0	7 c	281	46
16-Jul	0	241	76	88	3,209	73	0	0	0	0	281	46
17-Jul	3	244	77	117	3,326	76	0	0	0	0	281	46
18-Jul	5	249	79	73	3,399	78	0	0	0	2	283	46
19-Jul	4	253	80	161	3,560	81	0	0	0	4	287	47
20-Jul	9	262	83	109	3,669	84	0	0	0	3	290	48
21-Jul	5	267	84	72	3,741	85	0	0	0	1	291	48
22-Jul	2	269	85	95	3,836	88	0	0	0	0	291	48
23-Jul	0	269	85	79	3,915	89	0	0	0	13	304	50
24-Jul	0	269	85	67	3,982	91	0	0	0	0	304	50
25-Jul	6	275	87	62	4,044	92	0	0	0	1	305	50
26-Jul	5	280	89	53	4,097	94	0	0	0	19	324	53
27-Jul	2	282	89	23	4,120	94	0	0	0	0	324	53
28-Jul	1	283	90	49	4,169	95	0	0	0	4	328	54
29-Jul	8	291	92	39	4,208	96	0	0	0	5	333	55
30-Jul	5	296	94	21	4,229	97	1	1	0	98	431	71
31-Jul	0	296	94	15	4,244	97	1	2	0	52	483	79
1-Aug	2	298	94	21	4,265	97	0	2	0	4	487	80
2-Aug	0	298	94	22	4,287	98	0	2	0	5	492	81
3-Aug	0	298	94	15	4,302	98	0	2	0	2	494	81
4-Aug	1	299	95	17	4,319	99	0	2	0	0	494	81
5-Aug	0	299	95	5	4,324	99	0	2	0	0	494	81
6-Aug	1	300	95	4	4,328	99	2	4	0	20	514	84
7-Aug	2	302	96	13	4,341	99	0	4	0	14	528	87
8-Aug	0	302	96	3	4,344	99	2	6	0	0	528	87
9-Aug	3	305	97	5	4,349	99	6	12	0	0	528	87
10-Aug	2	307	97	6	4,355	99	6	18	0	0	528	87
11-Aug	0	307	97	6	4,361	100	4	22	1	0	528	87
12-Aug	4	311	98	4	4,365	100	26	48	1	5	533	87
13-Aug	1	312	99	2	4,367	100	27	75	2	6	539	88
14-Aug	0	312	99	0	4,367	100	23	98	2	5	544	89
15-Aug	1	313	99	0	4,367	100	36	134	3	2	546	90
16-Aug	0	313	99	3	4,370	100	49	183	5	2	548	90
17-Aug	0	313	99	1	4,371	100	20	203	5	6	554	91

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Table 1. (Page 2 of 2)

Date	Chinook Salmon			Chum Salmon			Coho Salmon			Longnose Sucker		
	Daily	Cumulative	Percent Passage	Daily	Cumulative	Percent Passage	Daily	Cumulative	Percent Passage	Daily	Cumulative	Percent Passage
18-Aug	0	313	99	0	4,371	100	159	362	9	1	555	91
19-Aug	0	313	99	0	4,371	100	17	379	10	0	555	91
20-Aug	0	313	99	1	4,372	100	11	390	10	1	556	91
21-Aug	0	313	99	0	4,372	100	266	656	16	1	557	91
22-Aug	0	313	99	0	4,372	100	326	982	25	1	558	91
23-Aug	0	313	99	1	4,373	100	328	1,310	33	2	560	92
24-Aug	0	313	99	1	4,374	100	397	1,707	43	12	572	94
25-Aug	1	314	99	2	4,376	100	301	2,008	50	13	585	96
26-Aug	0	314	99	0	4,376	100	267	2,275	57	3	588	96
27-Aug	0	314	99	0	4,376	100	107	2,382	60	7	595	98
28-Aug	0	314	99	0	4,376	100	134	2,516	63	1	596	98
29-Aug	0	314	99	0	4,376	100	121	2,637	66	1	597	98
30-Aug	0	314	99	0	4,376	100	127	2,764	69	1	598	98
31-Aug	0	314	99	1	4,377	100	205	2,969	75	1	599	98
1-Sep	0	314	99	0	4,377	100	133	3,102	78	2	601	99
2-Sep	0	314	99	0	4,377	100	107	3,209	81	0	601	99
3-Sep	0	314	99	0	4,377	100	63	3,272	82	2	603	99
4-Sep	0	314	99	0	4,377	100	90	3,362	84	1	604	99
5-Sep	0	314	99	0	4,377	100	118	3,480	87	1	605	99
6-Sep	0	314	99	0	4,377	100	134	3,614	91	4	609	100
7-Sep	0 e	314	99	0 e	4,377	100	109 e	3,723	93	1 c	610	100
8-Sep	0	314	99	0	4,377	100	79	3,802	95	0	610	100
9-Sep	0	314	99	0	4,377	100	39	3,841	96	0	610	100
10-Sep	0	314	99	0	4,377	100	19	3,860	97	0	610	100
11-Sep	0	314	99	0	4,377	100	21	3,881	97	0	610	100
12-Sep	0	314	99	0	4,377	100	37	3,918	98	0	610	100
13-Sep	1	315	100	0	4,377	100	13	3,931	99	0	610	100
14-Sep	0	315	100	0	4,377	100	14	3,945	99	0	610	100
15-Sep	1	316	100	0	4,377	100	16	3,961	99	0	610	100
16-Sep	0	316	100	0	4,377	100	7	3,968	100	0	610	100
17-Sep	0	316	100	0	4,377	100	7	3,975	100	0	610	100
18-Sep	0	316	100	0	4,377	100	2	3,977	100	0	610	100
19-Sep	0	316	100	0	4,377	100	2	3,979	100	0	610	100
20-Sep	0	316	100	0	4,377	100	5	3,984	100	0	610	100

a= estimated salmon passage (partial day)
b= estimated salmon passage (whole day)
c= no estimation for missed longnose sucker counts
d= date outside of target operational period (not included in accumulative totals)
e= no estimates for inoperable period

Table 2. Age and sex composition of chinook salmon at the Takotna River weir in 2002 based on escapement samples collected with a live trap.

Year	Sample Date (Stratum Dates)	Sample Size	Sex	Age Class 1.1 (Age 3)		1.2 (Age 4)		2.2 (Age 5)		1.3 (Age 5)		1.4 (Age 6)		1.5 (Age 7)		Totals	
				Esc.	%	Esc.	%	Esc.	%	Esc.	%	Esc.	%	Esc.	%	Esc.	%
2002	6/27 - 7/1	12	M	0	0	7	41.7	0	0	5	33.3	2	8.4	0	0	13	83.3
	(6/23 - 7/2)		F	0	0	1	8.3	0	0	0	0	1	8.3	0	0	3	16.7
			Subtotal	0	0	8	50	0	0	5	33.3	3	16.7	0	0	16	100
	7/4 - 7/11	43	M	0	0	51	23.3	5	2.3	62	27.9	46	20.9	0	0	164	74.4
	(7/3 - 13)		F	0	0	0	0	0	0	0	0	57	25.6	0	0	57	25.6
			Subtotal	0	0	51	23.3	5	2.3	62	27.9	103	46.5	0	0	221	100
	7/15 - 7/22	26	M	0	0	0	0	0	0	11	34.6	7	23.1	0	0	18	57.7
	(7/14 - 23)		F	0	0	1	3.8	0	0	3	7.7	10	30.7	0	0	14	42.3
			Subtotal	0	0	1	3.8	0	0	14	42.3	17	53.8	0	0	32	100
	7/25, 7/26,	17	M	0	0	8	17.6	0	0	11	23.5	5	11.8	0	0	25	52.9
	7/29, 7/30, 8/6		F	0	0	0	0	0	0	3	5.9	17	35.3	3	5.9	22	47.1
	(7/24 - 9/19)		Subtotal	0	0	8	17.6	0	0	14	29.4	22	47.1	3	5.9	47	100
	Season	98	M	0	0	66	21	5	1.6	89	28.2	61	19.1	0	0	221	70
			F	0	0	3	0.8	0	0	5	1.7	84	26.7	3	0.9	95	30
			Total	0	0	69	21.8	5	1.6	94	29.9	145	45.8	3	0.9	316	100

Table 3 Mean length (mm) of chinook salmon at the Takotna River weir in 2002 based on escapement samples collected with a live trap.

Year	Sample Date (Stratum Date)	Sex		Age Class 1.1 (Age 3)	1.2 (Age 4)	2.2 (Age 5)	1.3 (Age 5)	1.4 (Age 6)	1.5 (Age 7)
2002	6/27- 7/1 (6/23 - 7/2)	M	Mean Length		544		679	765	
			Std. Error		12		12	-	
			Range		500- 565		645- 695	765- 765	
			Sample Size	0	5	0	4	1	0
		F	Mean Length		575			865	
			Std. Error		-			-	
			Range		575- 575			865- 865	
			Sample Size	0	1	0	0	1	0
	7/4 - 7/11 (7/3 - 13)	M	Mean Length		553	560	679	756	
			Std. Error		6	-	12	25	
			Range		520- 580	560- 560	595- 742	645- 850	
			Sample Size	0	10	1	12	9	0
		F	Mean Length					876	
			Std. Error					13	
			Range					800- 960	
			Sample Size	0	0	0	0	11	0
	7/15 - 7/22 (7/14 - 23)	M	Mean Length				686	763	
			Std. Error				14	38	
			Range				620- 745	612- 875	
			Sample Size	0	0	0	9	6	0
		F	Mean Length		627		814	835	
			Std. Error		-		20	20	
			Range		627- 627		794- 833	740- 922	
			Sample Size	0	1	0	2	8	0
	7/25, 7/26, 7/29, 7/30, 8/6 (7/24 - 9/19)	M	Mean Length		568		678	839	
			Std. Error		22		14	19	
			Range		543- 612		648- 710	820- 858	
			Sample Size	0	3	0	4	2	0
		F	Mean Length				825	855	827
			Std. Error				-	36	-
			Range				825- 825	755- 976	827- 827
			Sample Size	0	0	0	1	6	1
	Season	M	Mean Length		554	560	679	765	
			Range		500- 612	560- 560	595- 745	612- 875	
			Sample Size	0	18	1	29	18	0
		F	Mean Length		600		820	867	827
			Range		575- 627		794- 833	740- 976	827- 827
			Sample Size	0	2	0	3	26	1

Table 4. Age and sex composition of chum salmon at the Takotna River weir in 2002 based on escapement samples collected with a live trap.

Year	Sample Date (Stratum Dates)	Sample Size	Sex	Age Class 0.2 (Age 3) Esc.	%	0.3 (Age 4) Esc.	%	0.4 (Age 5) Esc.	%	0.5 (Age 6) Esc.	%	Totals	
2002	6/27, 6/28	190	M	0	0.0	59	11.1	188	35.2	6	1.1	253	47.4
	(6/23 - 6/29)		F	0	0.0	76	14.2	200	37.4	5	1.0	281	52.6
			Subtotal	0	0.0	135	25.3	388	72.6	11	2.1	534	100.0
	7/1, 7/2, 7/3	137	M	0	0.0	207	23.4	311	35	7	0.7	525	59.1
	(6/30-7/5)		F	0	0.0	156	17.5	188	21.2	19	2.2	363	40.9
			Subtotal	0	0.0	363	40.9	499	56.2	26	2.9	888	100.0
	7/8, 7/9, 7/10	164	M	9	0.6	277	19.5	476	33.5	9	0.6	770	54.3
	(7/6 - 7/12)		F	8	0.6	311	22.0	329	23.2	0	0.0	649	45.7
			Subtotal	17	1.2	588	41.5	805	56.7	9	0.6	1419	100.0
	7/15, 7/16, 7/17	131	M	6	0.8	208	29.0	115	16	0	0.0	329	45.8
	(7/13 - 7/19)		F	5	0.7	187	26.0	198	27.5	0	0.0	390	54.2
			Subtotal	11	1.5	395	55.0	313	43.5	0	0.0	719	100.0
	7/22, 7/23, 7/24	141	M	15	2.8	213	39.7	84	15.6	4	0.7	316	58.9
	(7/20 - 7/26)		F	23	4.3	153	28.4	45	8.5	0	0.0	221	41.1
			Subtotal	38	7.1	366	68.1	129	24.1	4	0.7	537	100.0
	7/29 - 8/7	61	M	27	9.9	74	26.3	23	8.2	0	0.0	124	44.3
	(7/27 - 9/20)		F	14	4.9	73	26.2	64	22.9	5	1.6	156	55.7
			Subtotal	41	14.8	147	52.5	87	31.1	5	1.6	280	100.0
	Season	824	M	57	1.3	1039	23.7	1197	27.4	24	0.5	2317	52.9
			F	51	1.2	955	21.8	1024	23.4	30	0.7	2064	47.1
			Total	108	2.5	1994	45.5	2221	50.8	54	1.2	4377	100.0

Table 5. Mean length (mm) of chinook salmon at the Takotna River weir in 2002 based on escapement samples collected with a live trap.

Year	Sample Date (Stratum Dates)	Sex		Age Class 0.2 (Age 3)	0.3 (Age 4)	0.4 (Age 5)	0.5 (Age 6)
2002	6/27, 6/28 (6/23 - 6/29)	M	Mean Length		590	609	613
			Std Error		5	3	8
			Range		544-624	550-660	605-620
			Sample Size	0	21	67	2
		F	Mean Length		574	582	583
			Std Error		4	3	28
			Range		537-625	526-630	555-610
			Sample Size	0	27	71	2
	7/1, 7/2, 7/3 (6/30 - 7/5)	M	Mean Length		590	610	572
			Std Error		7	4	-
			Range		520-696	543-680	572-572
			Sample Size	0	32	48	1
		F	Mean Length		555	576	555
			Std Error		5	4	3
			Range		500-583	530-611	551-562
			Sample Size	0	24	29	3
	7/8, 7/9, 7/10 (7/6-7/12)	M	Mean Length	556	579	605	612
			Std Error	-	5	4	-
			Range	556-556	525-633	525-690	612-612
			Sample Size	1	32	55	1
		F	Mean Length	496	556	571	
			Std Error	-	4	4	
			Range	496-496	498-615	519-625	
			Sample Size	1	36	38	0
	7/15, 7/16, 7/17 (7/13 - 7/19)	M	Mean Length	515	589	605	
			Std Error	-	5	7	
			Range	515-515	538-648	550-655	
			Sample Size	1	38	21	0
		F	Mean Length	532	542	573	
			Std Error	-	4	5	
			Range	532-532	508-586	515-643	
			Sample Size	1	34	36	0

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Table 5. (Page 2 of 2)

Year	Sample Date (Stratum Dates)	Sex		Age Class 0.2 (Age 3)	0.3 (Age 4)	0.4 (Age 5)	0.5 (Age 6)
2002 (cont.)	7/22, 7/23, 7/24 (7/20 - 7/26)	M	Mean Length	563	578	591	610
			Std Error	22	4	7	-
			Range	506-605	493-660	550-672	610-610
			Sample Size	4	56	22	1
		F	Mean Length	528	551	561	
			Std Error	8	4	7	
			Range	498-552	476-611	528-600	
			Sample Size	6	40	12	0
	7/29 - 8/7 (7/27 - 9-20)	M	Mean Length	538	578	605	
			Std Error	11	6	20	
			Range	510-586	515-611	550-650	
			Sample Size	6	16	5	0
		F	Mean Length	503	536	552	587
			Std Error	12	7	5	-
			Range	482-522	485-574	518-603	587-587
			Sample Size	3	16	14	1
	Season	M	Mean Length	545	583	606	601
			Range	506-605	493-696	525-690	572-620
			Sample Size	12	195	218	5
		F	Mean Length	516	552	573	565
			Range	482-552	476-625	515-643	551-610
			Sample Size	11	177	200	6

Table 6. Age and sex composition of coho salmon at the Takotna River weir in 2002 based on escapement samples collected with a live trap.

Year	Sample Date (Stratum Dates)	Sample Size	Sex	Age Class 1.1 (Age 3)		2.1 (Age 4)		3.1 (Age 5)		Totals	
				Esc.	%	Esc.	%	Esc.	%		
2002	8/19, 8/20, 8/22, 8/23 (6/23 - 8/25)	123	M	0	0	1388	69.1	33	1.6	1420	70.7
			F	0	0	506	25.2	81	4.1	588	29.3
			Subtotal	0	0	1894	94.3	114	5.7	2008	100.0
	8/27 - 8/28 (6/26 - 31)	114	M	0	0	523	54.4	34	3.5	556	57.9
			F	0	0	379	39.5	25	2.6	405	42.1
			Subtotal	0	0	902	93.9	59	6.1	961	100.0
	9/4 - 9/5 (9/1 - 20)	112	M	0	0	417	41.1	18	1.8	435	42.9
			F	9	0.9	544	53.5	27	2.7	580	57.1
			Subtotal	9	0.9	961	94.6	45	4.5	1015	100.0
	Season	349	M	0	0	2327	58.4	85	2.1	2412	60.5
			F	9	0.2	1429	35.9	134	3.4	1572	39.5
			Total	9	0.2	3756	94.3	219	5.5	3984	100.0

Table 7. Mean length (mm) of coho salmon at the Takotna River weir in 2002 based on escapement samples collected with a live trap.

Year	Sample Date (Stratum Dates)	Sex		Age Class 1.1 (Age 3)	2.1 (Age 4)	3.1 (Age5)
2002	8/19, 8/20, 8/22, 8/23 (6/23 - 8/25)	M	Mean Length		530	480
			Std. Error		5	45
			Range		440- 615	435- 525
			Sample Size	0	85	2
		F	Mean Length		564	628
			Std. Error		4	47
			Range		525- 620	536- 810
			Sample Size	0	31	5
	8/27 - 8/28 (8/26 - 8/31)	M	Mean Length		563	607
			Std. Error		6	12
			Range		405- 630	580- 635
			Sample Size	0	62	4
		F	Mean Length		570	591
			Std. Error		4	14
			Range		516- 648	567- 615
			Sample Size	0	45	3
	9/4 - 9/5 (9/1 - 9/20)	M	Mean Length		568	550
			Std. Error		8	40
			Range		405- 660	510- 590
			Sample Size	0	46	2
		F	Mean Length	535	579	591
			Std. Error	-	4	11
			Range	535- 535	500- 650	578- 612
			Sample Size	1	60	3
	Season	M	Mean Length		545	546
			Range		405- 660	435- 635
			Sample Size	0	193	8
		F	Mean Length	535	571	613
			Range	535- 535	500- 650	536- 810
			Sample Size	1	136	11

Table 8. Information summary for tagged chum and coho salmon observed at the Takotna River weir, 2002.

Date		Species	Tag Information		Sample	Tagging	
Tagged	Observed		Tag No.	Tag Color	Type	Location	Tagging Gear
6/18	7/3	chum	15164	Green	ASL	Birchtree	Wheel
6/16	7/4	chum	15054	Green	ASL	Birchtree	Wheel
6/16	7/4	chum	15066	Green	ASL	Birchtree	Wheel
	7/8	chum	nr	Green			
6/24	7/9	chum	15611	Green	E	Birchtree	Wheel
6/27	7/11	chum	9379	Green	E	Kalskag	Wheel
	7/12	chum	nr	Green			
6/26	7/14	chum	19056	Blue	E	Kalskag	Drift
	8/16	coho	nr	Green			
7/28	8/17	coho	19508	Blue	E	Kalskag	Wheel
8/9	8/24	coho	29881	Pink	A	Kalskag	Wheel
7/30	8/24	coho	19862	Blue	E	Kalskag	Wheel
8/6	8/26	coho	25070	Green	E	Birchtree	Wheel
8/6	8/26	coho	25066	Green	A	Birchtree	Wheel
8/8	8/26	coho	25569	Green	A	Birchtree	Wheel
	8/26	coho	nr	Green	E		
8/4	8/27	coho	24742	Green	ASL	Birchtree	Wheel
8/8	8/28	coho	25554	Green	ASL	Birchtree	Wheel
8/7	8/28	coho	29295	Pink	E	Birchtree	Wheel
8/7	8/29	coho	25471	Green	E	Birchtree	Wheel
8/12	8/29	coho	26011	Green	E	Birchtree	Wheel
8/5	8/29	coho	29528	Pink	A	Kalskag	Wheel
8/7	8/29	coho	25462	Green	E	Birchtree	Wheel
8/10	8/30	coho	36192	White	E	Birchtree	Drift
8/12	8/30	coho	25995	Green	A	Birchtree	Wheel
8/15	8/31	coho	26408	Green	A	Birchtree	Wheel
8/11	8/31	coho	25947	Green	A	Birchtree	Wheel
8/13	8/31	coho	30089	Pink	E	Kalskag	Wheel
8/15	9/1	coho	26402	Green	E	Birchtree	Wheel
8/7	9/1	coho	25241	Green	A	Birchtree	Wheel
8/9	9/1	coho	29773	Pink	E	Birchtree	Wheel
8/14	9/1	coho	36274	White	E	Birchtree	Drift
8/9	9/1	coho	30095	Pink	E	Kalskag	Wheel
8/7	9/2	coho	20118	Blue	E	Kalskag	Drift
8/10	9/2	coho	29121	Pink	E	Kalskag	Wheel
7/30	9/3	coho	23681	Green	E	Birchtree	Wheel
8/19	9/3	coho	26879	Green	A	Birchtree	Wheel
8/8	9/3	coho	20128	Blue	E	Kalskag	Drift

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Table 8. (Page 2 of 2)

Date		Species	Tag No.	Tag Color	Sample	Tagging	
Tagged	Recovered				Type	Location	Tagging Gear
8/7	9/3	coho	36096	White	E	Birchtree	Drift
8/17	9/4	coho	26613	Green	A	Birchtree	Wheel
8/17	9/5	coho	26614	Green	ASL	Birchtree	Wheel
8/14	9/5	coho	26332	Green	ASL	Birchtree	Wheel
8/18	9/5	coho	31224	Pink	ASL	Kalskag	Wheel
8/16	9/5	coho	31152	Pink	ASL	Kalskag	Wheel
8/11	9/5	coho	29919	Pink	A	Kalskag	Wheel
8/13	9/5	coho	36263	White	ASL	Birchtree	Drift
8/16	9/5	coho	36350	White	ASL	Birchtree	Drift
8/12	9/6	coho	26079	Green	E	Birchtree	Wheel
8/2	9/6	coho	24549	Green	E	Birchtree	Wheel
8/19	9/7	coho	26858	Green	E	Birchtree	Wheel
8/17	9/7	coho	26665	Green	E	Birchtree	Wheel
8/21	9/7	coho	31363	Pink	A	Kalskag	Wheel
8/27	9/8	coho	35358	White	A	Birchtree	Drift
8/25	9/9	coho	31837	Pink	E	Kalskag	Wheel
8/22	9/9	coho	31455	Pink	A	Kalskag	Wheel
8/22	9/9	coho	35169	White	E	Birchtree	Drift
8/14	9/9	coho	20218	Blue	E	Kalskag	Drift
8/26	9/10	coho	27340	Green	E	Birchtree	Wheel
9/3	9/20	coho	20464	Blue	E	Kalskag	Drift
9/3	9/20	coho	35490	White	E	Birchtree	Drift

ASL = Age, sex, and length sample
A = Actively captured
E = Escapement
nr = Not recovered
Drift = Drift gillnet

Table 9. Daily climate and water level data collected at the Takotna River weir site, 2002.

Date	Time	Sky Codes	Precipitation	Wind	Temperature (°C)		Water Stage
					Air	Water	(cm)
6/23	11:00	2	0	SW 5	20.0	14.0	N/A
6/23	18:00	3	0	-0-	13.0	15.0	N/A
6/24	10:00	4	0	-0-	9.0	13.0	51.5
6/24	21:30	0			15.0	14.0	51.5 b
6/25	11:00	3	0	S 5	13.0	14.0	51.5
6/25	22:00	4	10	-0-	17.0	14.0	52.0
6/26	11:00	4	0	S 5	16.0 a	12.0	52.0
6/26	18:00	3	91	SW 5	16.0	15.0	54.0
6/27	9:00	2	0	SW 5	25.0	12.0	59.0
6/27	22:00	2	0	-0-	13.0	14.0	59.0
6/28	11:00	1	0	S 5	15.0	17.0	58.0
6/28	21:00	2	0	SE 5	16.0	17.0	56.0
6/29	11:00	4	0	-0-	13.0	14.0	54.0
6/29	21:00	3	0	-0-	14.0	16.0	53.0
6/30	11:00	4	0	-0-	14.0	13.0	52.0
6/30	20:30	2	0	SE 5	19.0	15.0	51.0
7/1	10:00	2	0	-0-	19.0 a	14.0	51.0
7/1	19:30	1	0	NE 15	20.0	17.0	50.0
7/2	11:00	4	0	SW 10	14.0	13.0	49.5
7/2	21:00	3	0	W 20	22.0	14.0	49.5
7/3	9:00	4	0	S 20	10.0	13.0	48.5
7/3	20:30	3	36	-0-	11.0	12.0	48.5
7/4	8:00	3	16	-0-	8.0	11.0	49.5
7/4	21:00	2	0.5	-0-	16.0	13.0	49.0
7/5	11:00	4	10	S 15	12.0	11.0	50.0
7/5	21:00	2	0	-0-	16.0	14.0	50.0
7/6	10:00	4	0	-0-	13.0	12.0	49.0
7/6	21:00	2	0	-0-	18.0	15.0	49.0
7/7	10:00	4	0	-0-	13.0	13.0	48.0
7/7	20:00	3	0	SW 5	13.0	14.0	48.0
7/8	11:00	4	0	-0-	13.0	11.0	47.0
7/8	21:00	2	0	-0-	13.0	16.0	47.0
7/9	11:00	3	0	-0-	15.0	13.0	46.0
7/9	21:00	3	0	-0-	18.0	14.0	46.0
7/10	9:00	3	0	-0-	14.0	14.0	46.0
7/10	21:00	2	0	-0-	17.0	16.0	47.0
7/11	11:00	2	80	-0-	20.0	14.0	45.5
7/11	21:00	4	0	-0-	16.0	17.0	45.5
7/12	11:00	3	0	-0-	15.0	15.0	45.0
7/12	21:00	4	1	-0-	21.0	17.0	45.0
7/13	11:00	4	10	-0-	13.0	16.0	45.0
7/13	21:00	4	26	-0-	16.0	14.0	45.5
7/14	11:00	4	4	-0-	14.0	15.0	45.0
7/14	21:00	3	3	-0-	15.0	16.0	45.0
7/15	9:00	4	0	-0-	15.0	15.0	45.0
7/15	20:30	1	0	-0-	24.0	17.0	45.0
7/16	11:00	2	0	-0-	15.0	15.0	45.0
7/16	21:00	2	0	SW 10	17.0	17.0	44.0
7/17	10:00	2	0	S 5	15.0	15.0	44.0
7/17	21:00	3	12	-0-	20.0	18.0	44.5
7/18	10:00	2	0	-0-	21.0	16.0	43.5
7/18	21:00	2	10	-0-	20.0	16.0	44.0
7/19	9:00	3	7	W 10	13.0	16.0	43.5
7/19	19:00	2	0	-0-	17.0	19.0	43.5
7/20	9:00	3	6	-0-	19.0	17.0	44.0
7/20	19:00	1	1	-0-	18.0	17.0	44.5
7/21	9:00	1	0	E 5	17.0	17.0	46.0
7/21	20:30	4	0	SW 3	18.0	13.0	45.5
7/22	11:00	4	0	S 5	12.0	10.0	46.5
7/22	21:00	3	0	-0-	13.0	13.0	46.5
7/23	11:00	2	0	E 3	12.0	14.0	45.5
7/23	21:00	2	0	-0-	17.0	15.0	46.0

-Continued-

Table 9. (Page 2 of 3)

Date	Time	Sky Codes	Precipitation	Wind	Temperature (°C)		Water Stage
					Air	Water	(cm)
7/24	10:30	4	4	SW 10	10.0	13.0	45.0
7/24	22:00	4	44	SW 5	10.0	12.0	45.0
7/25	10:30	3	1	S 5	7.0	11.0	44.5
7/25	21:00	2	0	-0-	16.0	13.0	44.5
7/26	10:00	4	8	SW 5	8.0	10.0	45.0
7/26	21:00	3	5	SW 5	7.0	10.0	46.0
7/27	11:00	4	3	-0-	12.0	9.0	46.5
7/27	21:00	4	36	-0-	10.0	8.0	47.0
7/28	11:00	3	1	E 5	12.0	9.0	48.0
7/28	21:00	2	0	-0-	9.0	11.0	49.0
7/29	11:00	1	1	-0-	10.0	9.0	51.5
7/29	21:00	1	0	E 10	10.0	12.0	53.0
7/30	10:30	1	0	SW 5	13.0	10.0	52.5
7/30	21:00	2	0	-0-	10.0	12.0	51.5
7/31	11:00	1	0	-0-	10.0	10.0	50.0
7/31	20:00	2	0	-0-	12.0	13.0	48.0
8/1	9:00	1	0	-0-	8.0	11.0	46.5
8/1	20:30	3	0	-0-	13.0	14.0	46.0
8/2	9:00	1	0	SW 5	5.0	11.0	44.5
8/2	19:00	1	0	-0-	20.0	14.0	44.0
8/3	9:00	0	0	-0-	9.0	12.0	43.5
8/3	19:00	0	0	-0-	23.0	15.0	43.0
8/4	9:00	0	0	-0-	11.0	12.0	42.0
8/4	19:00	0	0	-0-	16.0	15.0	40.0
8/5	9:00	0	0	W 5	13.0	12.0	41.5
8/5	19:00	3	0	W 5	13.0	15.0	41.5
8/6	9:00	0	0	-0-	13.0	13.0	41.0
8/6	19:00	3	0	SW 3	13.0	14.0	41.0
8/7	9:00	2	0	-0-	2.0	10.0	40.5
8/7	19:00	2	0	SW 3	12.0	12.0	40.5
8/8	9:00	4	0	-0-	2.0	9.0	40.5
8/8	19:00	4	0	-0-	9.0	10.0	40.0
8/9	9:00	4	10	-0-	5.0	9.0	40.5
8/9	19:00	4	10	-0-	6.0	8.0	40.0
8/10	9:00	3	0	-0-	8.0	7.0	40.0
8/10	19:00	2	0	-0-	10.0	10.0	40.0
8/11	9:00	3	0	-0-	8.0	4.0	40.0
8/11	19:00	4	0	SW 5	7.0 a	7.0	40.0 b
8/12	9:00	4	8	-0-	6.0	7.0	40.0
8/12	21:00	4	0	SW 10	9.0	10.0	40.0
8/13	10:30	1	1	SW 5	7.0	5.0	39.5
8/13	21:00	1	0	W 5	8.0	10.0	40.0
8/14	11:00	4	0	SW 8	3.0	7.0	39.0
8/14	21:00	1	0	-0-	11.0	10.0	39.0
8/15	11:00	1	0	SW 8	7.0	11.0	39.0
8/15	21:00	4	0	-0-	10.0	10.0	38.5
8/16	11:00	4	0	SW 5	8.0	6.0	38.0
8/16	21:30	4	0	SW 20	7.0	9.0	38.0
8/17	11:00	4	0	SW 5	6.0	7.0	38.0
8/17	21:00	4	0	SW 10	5.0	8.0	37.5
8/18	10:30	4	1	SW 15	6.0	7.0	38.0
8/18	21:00	3	0	W 12	7.0	8.0	38.0
8/19	11:00	3	0	W 5	1.0	6.0	38.5
8/19	21:00	2	0	-0-	7.0	9.0	39.0
8/20	10:30	2	0	-0-	5.0	6.0	38.5
8/20	21:30	4	2	-0-	6.0	7.0	39.0
8/21	10:30	4	95	-0-	5.0	6.0	40.0
8/21	21:00	4	98	-0-	5.0	6.0	41.0
8/22	11:00	4	49	E 5	6.0	6.0	42.5
8/22	21:00	4	5	-0-	6.0	7.0	44.0
8/23	10:30	4	2	-0-	6.0	6.0	48.0
8/23	21:00	4	0	-0-	8.0	7.0	50.0

-Continued-

Table 9. (Page 3 of 3)

Date	Time	Sky Codes	Precipitation	Wind	Temperature (°C)		Water Stage
					Air	Water	(cm)
8/24	11:30	4	11	-0-	7.0	7.0	52.0
8/24	21:00	2	5	-0-	10.0	9.0	51.0
8/25	11:00	2	0	-0-	4.0	7.0	50.0
8/25	21:00	4	5	-0-	11.0	8.0	50.0
8/26	11:00	4	3	SW 5	3.0	6.0	49.5
8/26	21:00	1	0	-0-	9.0	9.0	49.0
8/27	11:00	1	0	SW 5	5.0	6.0	48.0
8/27			0		5.0 a	7.0	47.0 b
8/28	11:00	3	6	W 5	5.0	7.0	46.0
8/28	21:00	3	21	-0-	6.0	8.0	46.0
8/29	11:00	1	2	W 5	2.0	6.0	45.0
8/29	21:00	2	0	-0-	10.0	8.0	44.0
8/30	11:00	3	0	-0-	7.0	6.0	43.5
8/30	21:00	4	0	W 5	8.0	8.0	43.5
8/31	11:00	4	7	-0-	8.0	8.0	45.5
8/31	21:00	3	58	-0-	9.0	8.0	45.0
9/1	10:30	2	1	NW 5	3.0	5.0	45.0
9/1	21:00	2	1	SW 5	8.0	7.0	44.0
9/2	11:00	1	0	W 5	7.0	6.0	47.0
9/2	21:00	4	0	-0-	6.0	7.0	47.0
9/3	11:00	2	0	-0-	10.0	6.0	45.0
9/3	21:00	4	0	SW 10	9.0	8.0	45.0
9/4	11:00	3	0	-0-	7.0	7.0	44.0
9/4	21:00	4	100	S 5	8.0	7.0	45.0
9/5	11:00	4	65	-0-	10.0	8.0	47.0
9/5	21:00	4	2	-0-	7.0	8.0	49.0
9/6	11:00	4	3	-0-	6.0	7.0	55.5
9/6	21:00	4	12	-0-	8.0	8.0	57.0
9/7	11:00	3	3	S 5	5.0	6.0	59.0
9/7	21:00	3	12	-0-	7.0	6.0	59.0
9/8	11:00	4	0	S 5	3.0	6.0	60.0
9/8	21:00	2	10	-0-	3.0	6.0	60.0
9/9	11:00	3	2	SW 5	-3.0	4.0	59.5
9/9	21:00	3	0	-0-	2.0	5.0	59.0
9/10	11:00	3	0	W 5	-2.0	3.0	57.5
9/10	21:00	4	0	S 15	3.0	4.0	57.0
9/11	10:30	4	5	-0-	4.0	3.0	56.0
9/11	21:00	4	26	-0-	6.0	5.0	57.0
9/12	11:00	4	17.5	SE 10	7.0 a	5.0	62.5
9/12	21:00	4	1	SE 15	7.0	5.0	70.0
9/13	11:00	4	1	-0-	7.0	4.0	74.0
9/13	21:00	4	0	-0-	6.0	5.0	89.0
9/14	10:00	3	15	-0-	9.0	4.0	93.0
9/14	21:00	2	3	-0-	10.0	8.0	93.0
9/15	10:00	4	6	NE 5	4.0	4.0	90.0
9/15	21:00	3	20	-0-	5.0	4.0	90.0
9/16	10:00	3	10	-0-	7.0 a	4.0	88.0
9/16	21:00	3	0.5	-0-	7.0	5.0	80.0
9/17	10:00	2	0	-0-	5.0	4.0	80.0
9/17	21:00	2	0	NW 5	7.0	5.0	75.0
9/18	10:00	3	0	-0-	2.0	3.0	74.0
9/18	21:00	4	1	-0-	1.0	4.0	75.0
9/19	10:00	2	0	-0-	-1.0	2.0	72.0
9/19	18:00	3	5	-0-	1.0	2.0	73.0
9/20	10:00	1	0	NW 5	-3.0	1.0	70.0
9/20	21:00	1	0	-0-	1.0	2.0	69.0
				Averages	10.3	10.2	49.8

a = estimated temperature
b= estimated water stage

Sky Codes
0 = no observation
1 = clear or mostly clear (<10% clou
2 = cloud cover less than 50% of the
3 = cloud cover more than 50% of tl
4 = complete overcast

Table 10. Juvenile chinook and coho salmon data collected in the Takotna River drainage, 2002.

Index Area[c]	Chinook								Coho							
	Seine			Trap				Percent by Index Area	Seine			Trap				Percent by Index Area
	No. of Sets	No. of Fish	CPUE[a]	No. of Sets	Soak (hrs)	No. of Fish	CPUE[b]		No. of Sets	No. of Fish	CPUE[a]	No. of Sets	Soak (hrs)	No. of Fish	CPUE[b]	
1	0	na	na	0	na	na	na	na	0	na	na	0	na	na	na	na
2	0	na	na	38	21	4	0.09	2	0	na	na	38	21	7	0.16	4
3	0	na	na	65	26	29	0.48	17	0	na	na	65	26	134	2.20	74
4	0	na	na	45	23.0	132	2.81	78	0	na	na	45	23	27	0.58	15
5	0	na	na	20	23	4	0.19	2	0	na	na	20	23	13	0.61	7
6	0	na	na	0	na	na	na	na	0	na	na	0	na	na	na	na
7	0	na	na	0	na	na	na	na	0	na	na	0	na	na	na	na
8	0	na	na	5	16	0	0.00	0	0	na	na	5	16	0	0.00	0
9	0	na	na	0	na	na	na	na	0	na	na	0	na	na	na	na
10	0	na	na	0	na	na	na	na	0	na	na	0	na	na	na	na
11	17	0	0.00	0	na	na	na	na	17	0	0.00	0	na	na	na	na
12	0	na	na	0	na	na	na	na	0	na	na	0	na	na	na	na
13	0	na	na	0	na	na	na	na	0	na	na	0	na	na	na	na
Totals	17	0	0.00	173		169	0.98	100	17	0	0.00	173		181	1.05	100

[a] CPUE is defined as the number of salmon captured per seine attempt

[b] CPUE is defined as the number of salmon captured per trap per 24-hr period

[c] Area

1 below weir
2 above weir to 4th of July Creek
3 Big Creek (lower)
4 4th of July Creek
5 Fourth of July Creek to Big Waldren Fork
6 Bonnie Creek
7 Minnie Creek
8 Big Waldren Fork
9 Big Waldren Fork to Moore Creek/Little Waldren Confluence
10 Little Waldren Fork
11 Moore Creek
12 Big Creek (upper)
13 Tatalina Creek

Table 11. Historic chinook salmon escapements for selected tributaries of the Kuskokwim River.

Escapement Project	Year				
Weir	1996	1997	2000	2001	2002
Takotna River	401	1,176	345	723	316
Tatlawiksuk River			817	2,010	2,237
Kogrukluk River	14,199	13,286	3,310	9,298	10,099
George River	7,716	7,834	2,960	3,309	2,444
Kwethluk River		10,395	3,547		8,397
Aerial Survey					
Salmon River (Pitka Fork)			374	1,029	1,276
Cheeneetnuk River		345			730
Holitna River		2,093	501	1,760	1,741
Oskawalik River		1,470	62	181	235
Holokuk River	85	165	42	52	513
Salmon River (Aniak River)	983	980	152	703	1,236
Kipchuk River (Aniak River)		855	182		1,615
Aniak River	3,496	2,187	714		1,856
Kisaralik River	439				2,285

Figures

Figure 1. Kuskokwim Area salmon management districts and escapement monitoring projects.

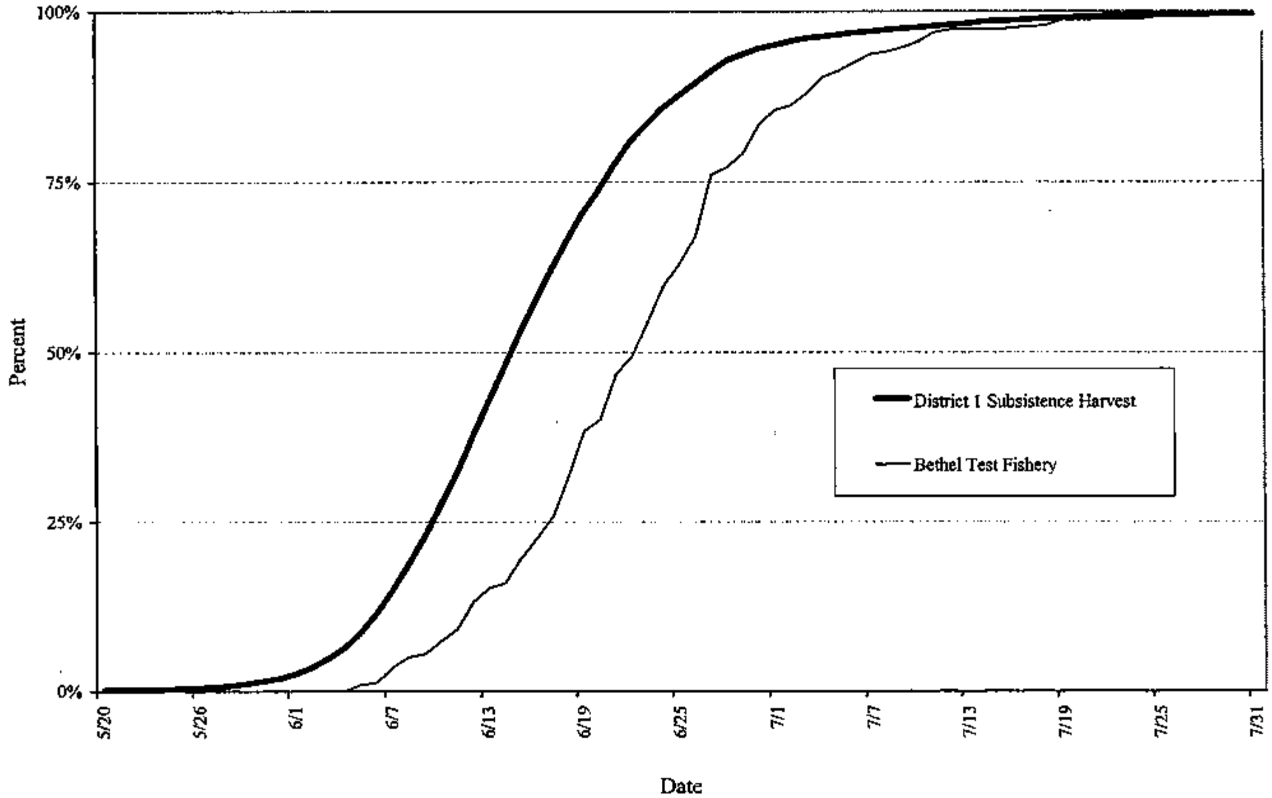

Figure 2. Average timing of the subsistence chinook salmon harvest in District 1 compared with the average run timing observed in Bethel test fishery, 1984 through 1999.

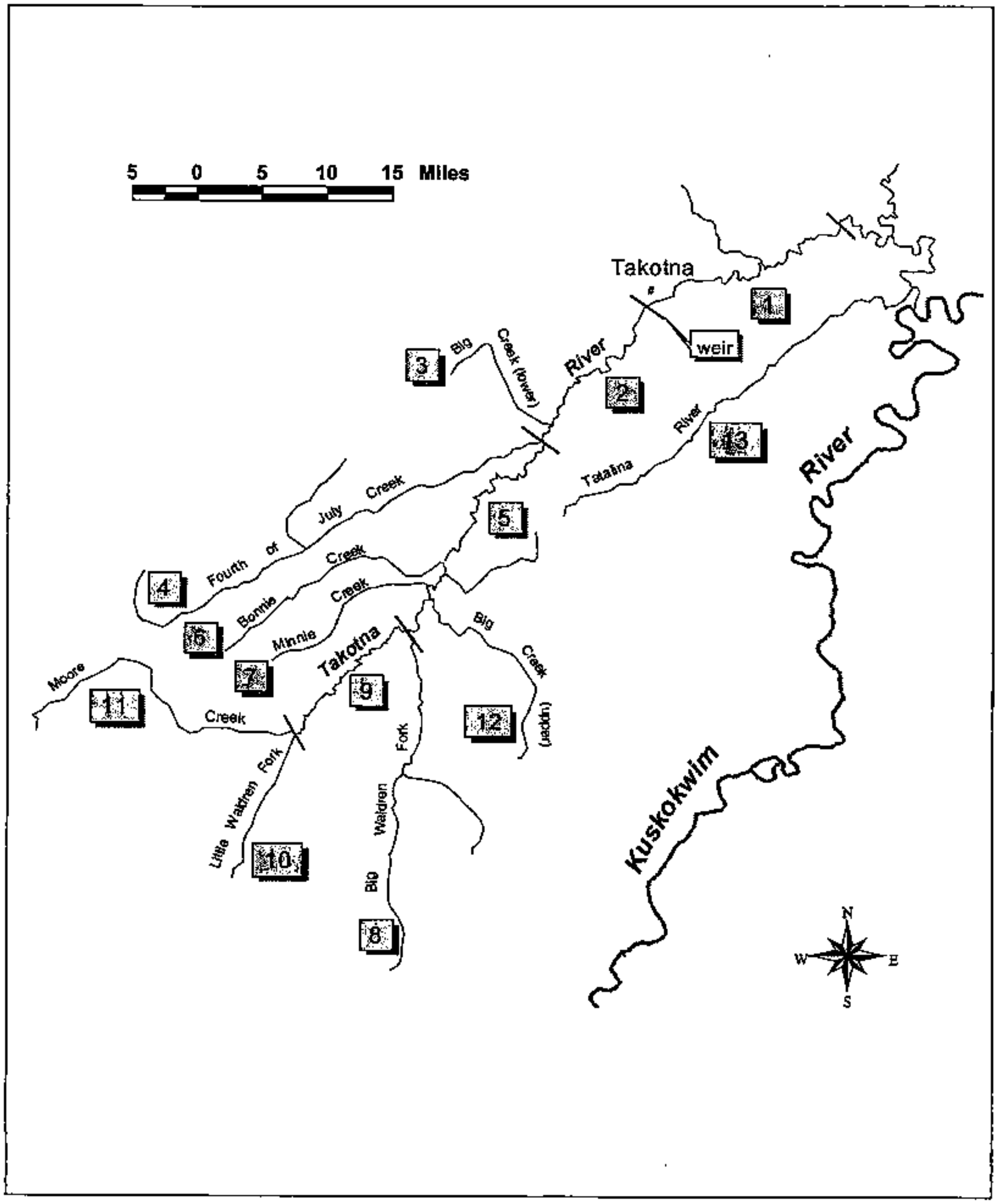

Figure 3. Index areas used for juvenile salmon investigation in the Takotna River drainage.

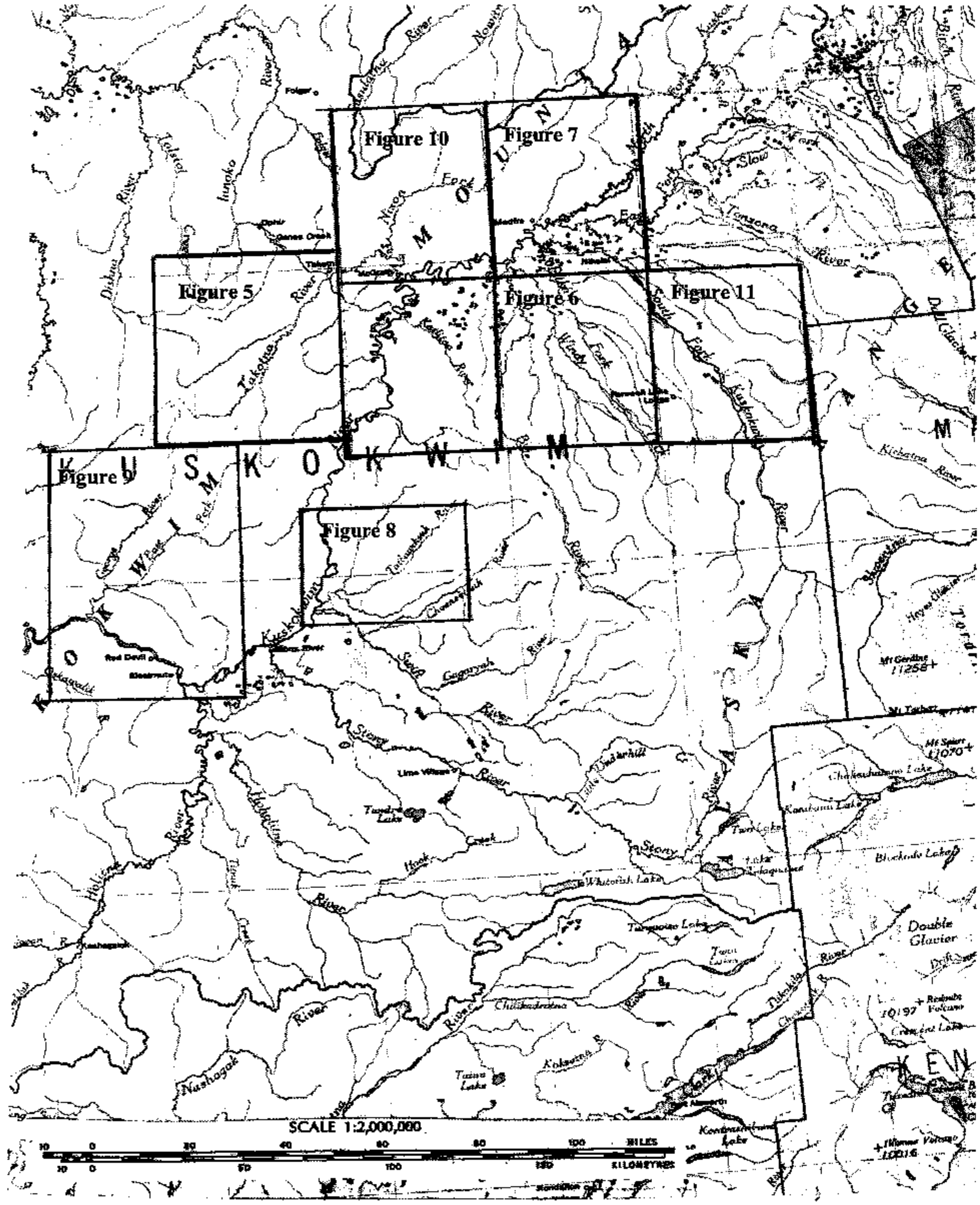

Figure 4. Reference map of the upper and middle Kuskokwim River for figures 5 to 11.

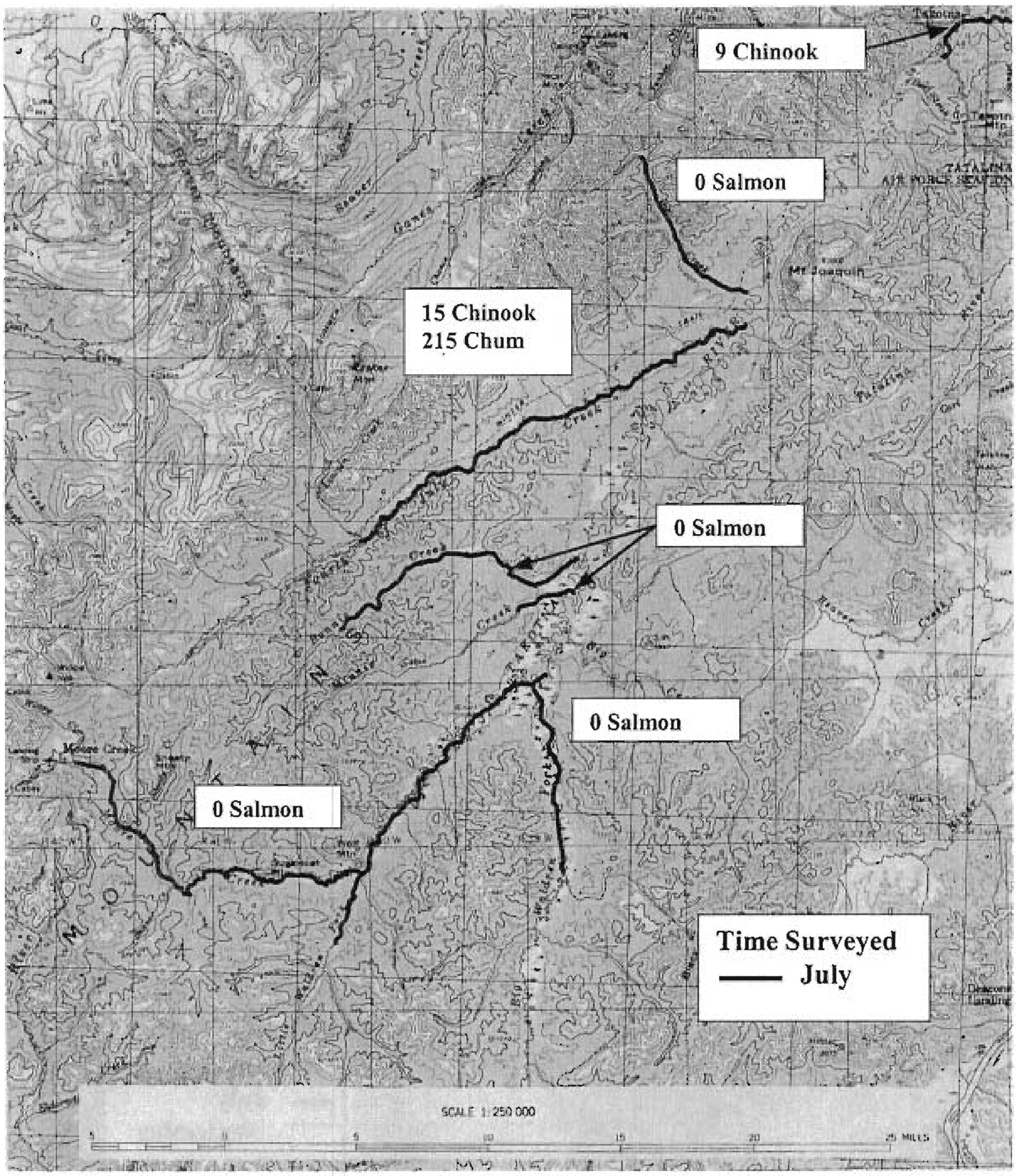

Figure 5. Aerial Survey streams: Takotna River drainage.

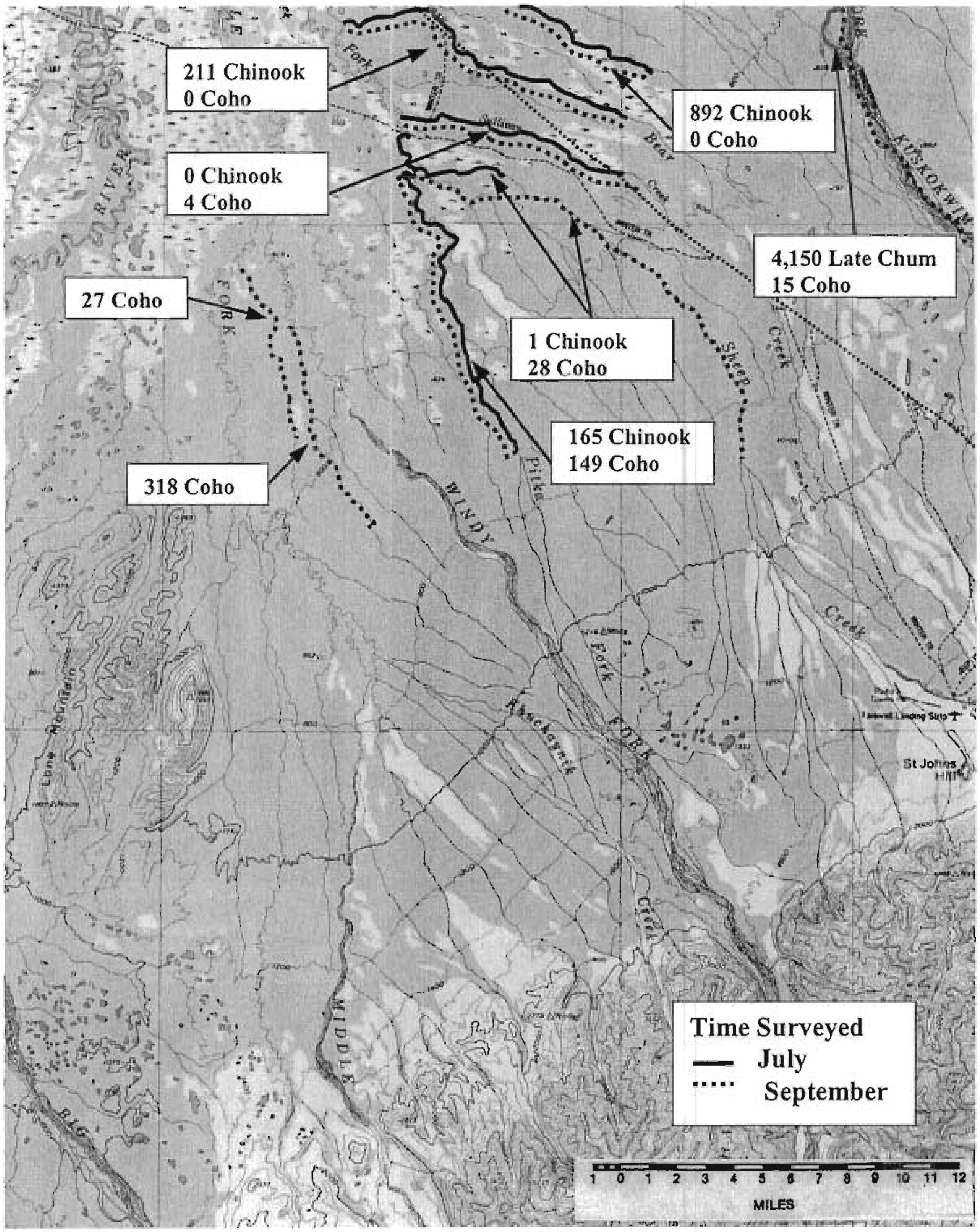

Figure 6. Aerial survey streams: Middle Fork, Windy Fork, Pitka Fork, and South Fork Kuskokwim Rivers.

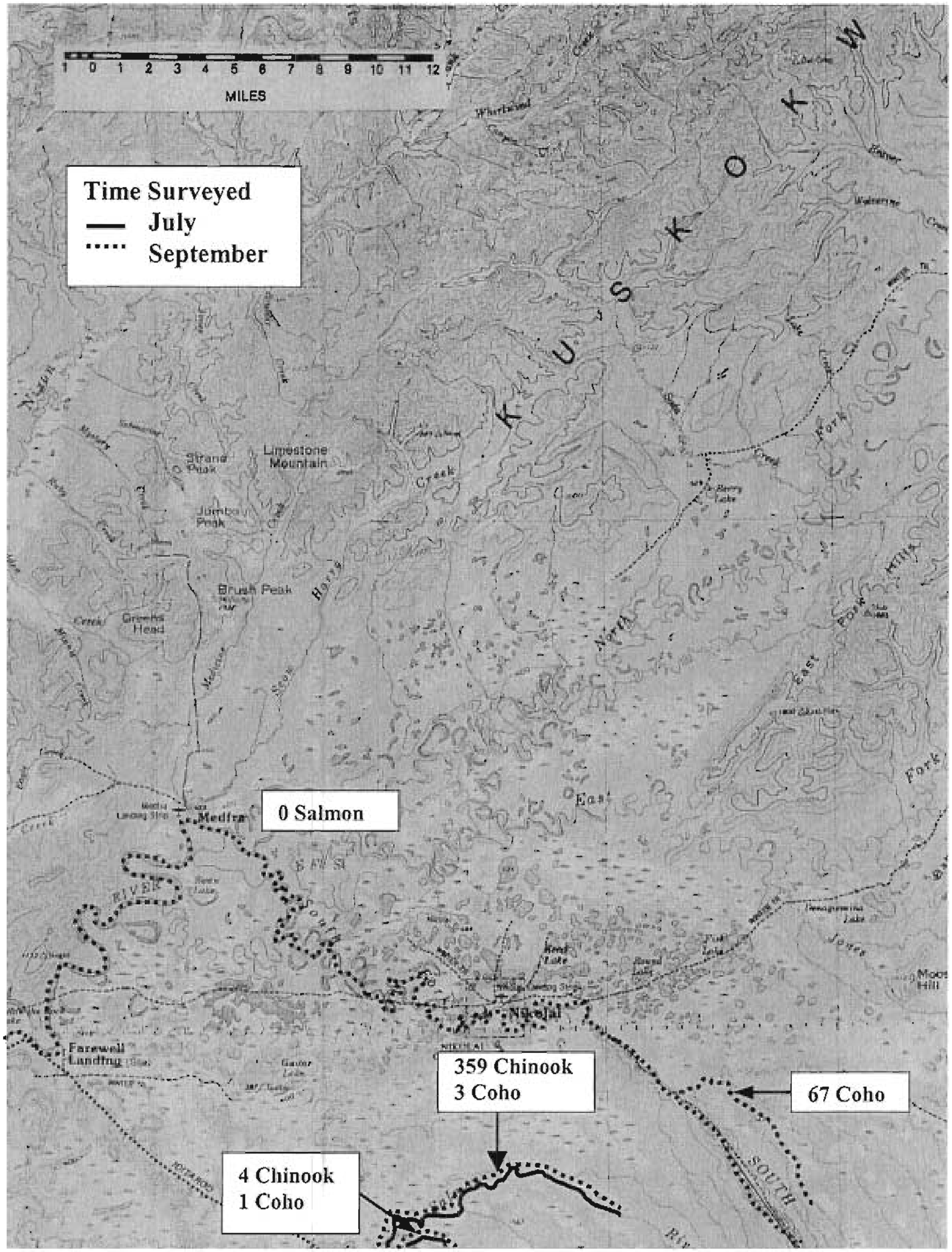

Figure 7. Aerial survey streams: Upper Kuskokwim River and Pitka Fork drainages.

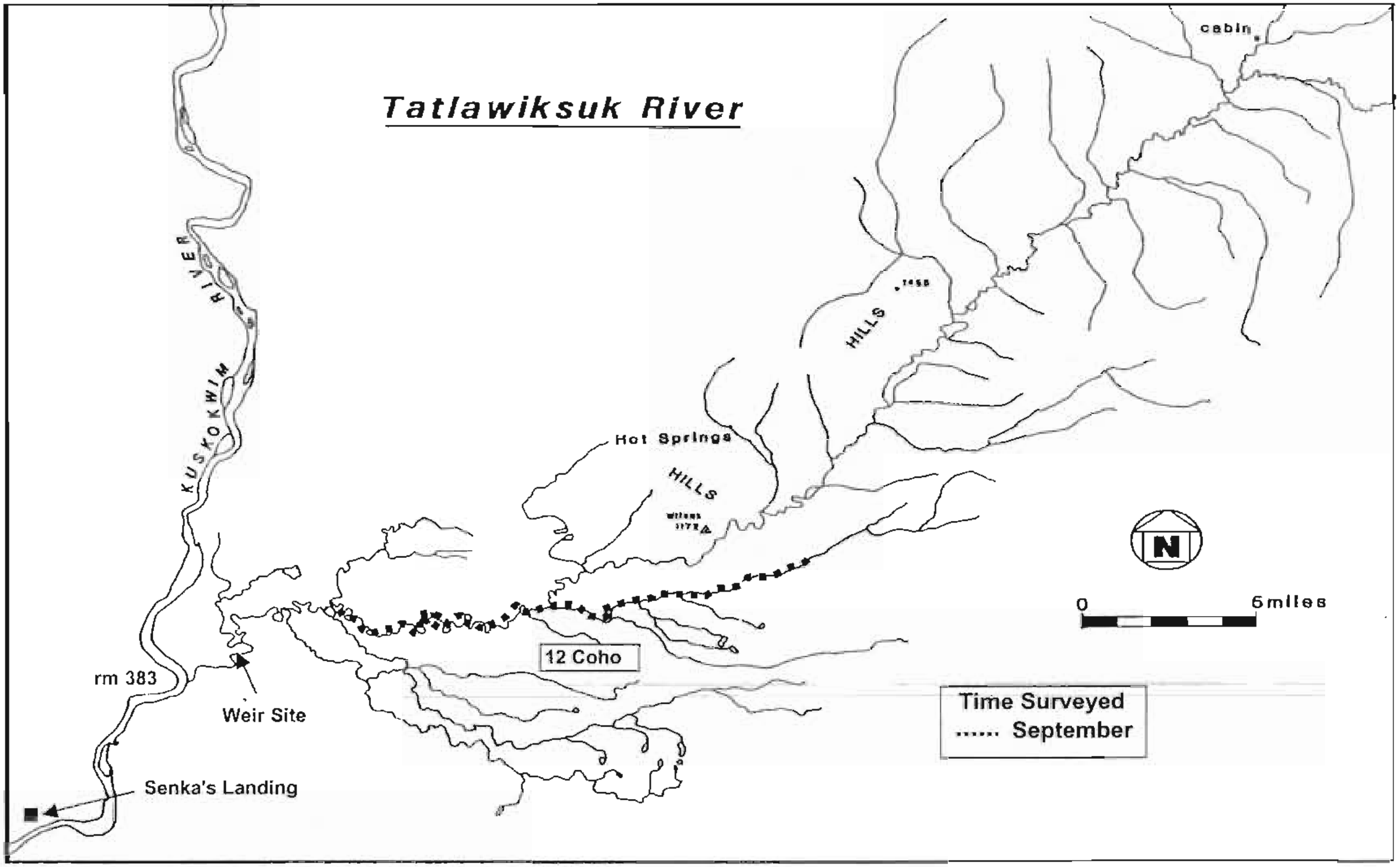

Figure 8. Aerial survey streams: Tatlawiksuk River, middle Kuskokwim River basin.

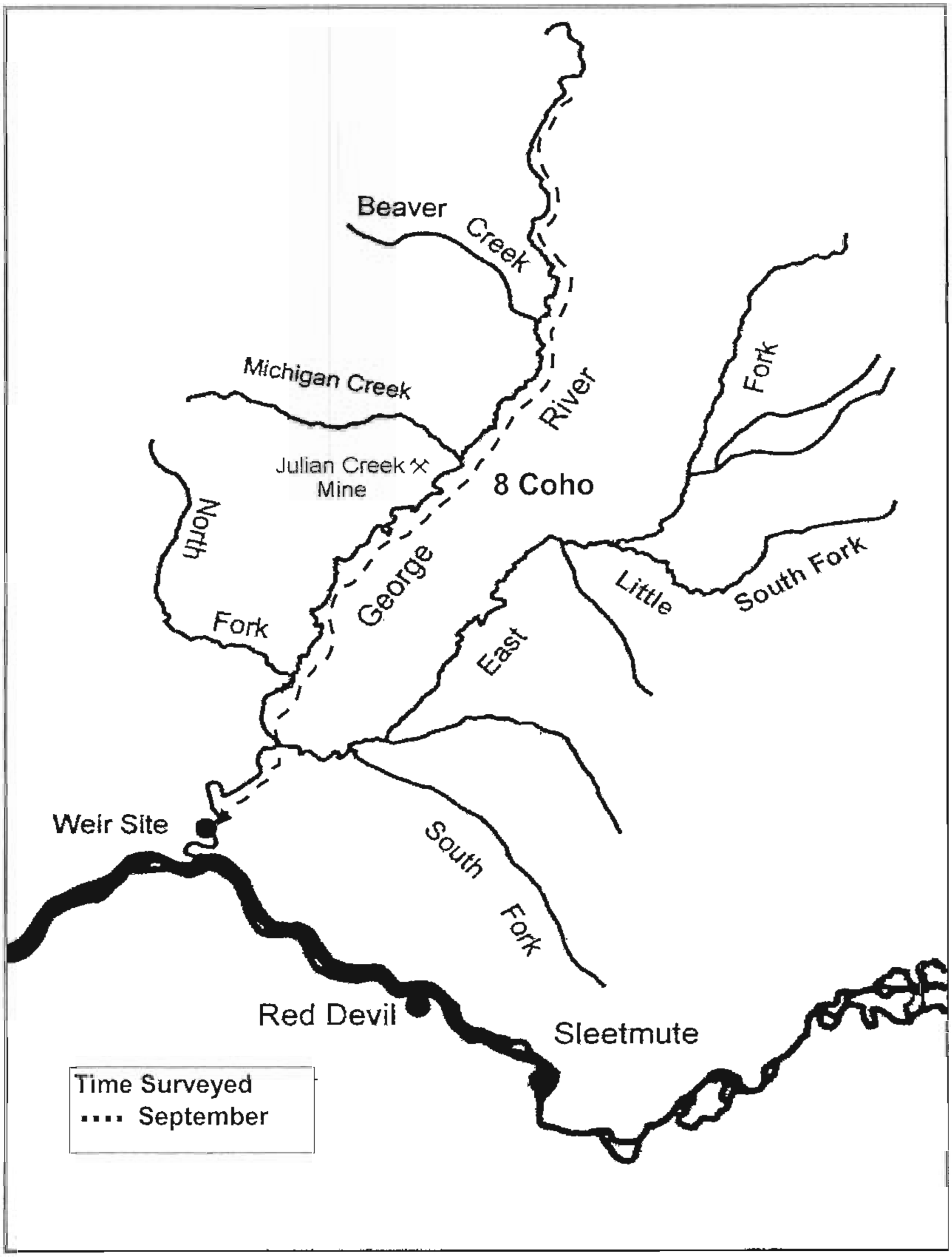

Figure 9. Aerial survey streams: George River, middle Kuskokwim River basin.

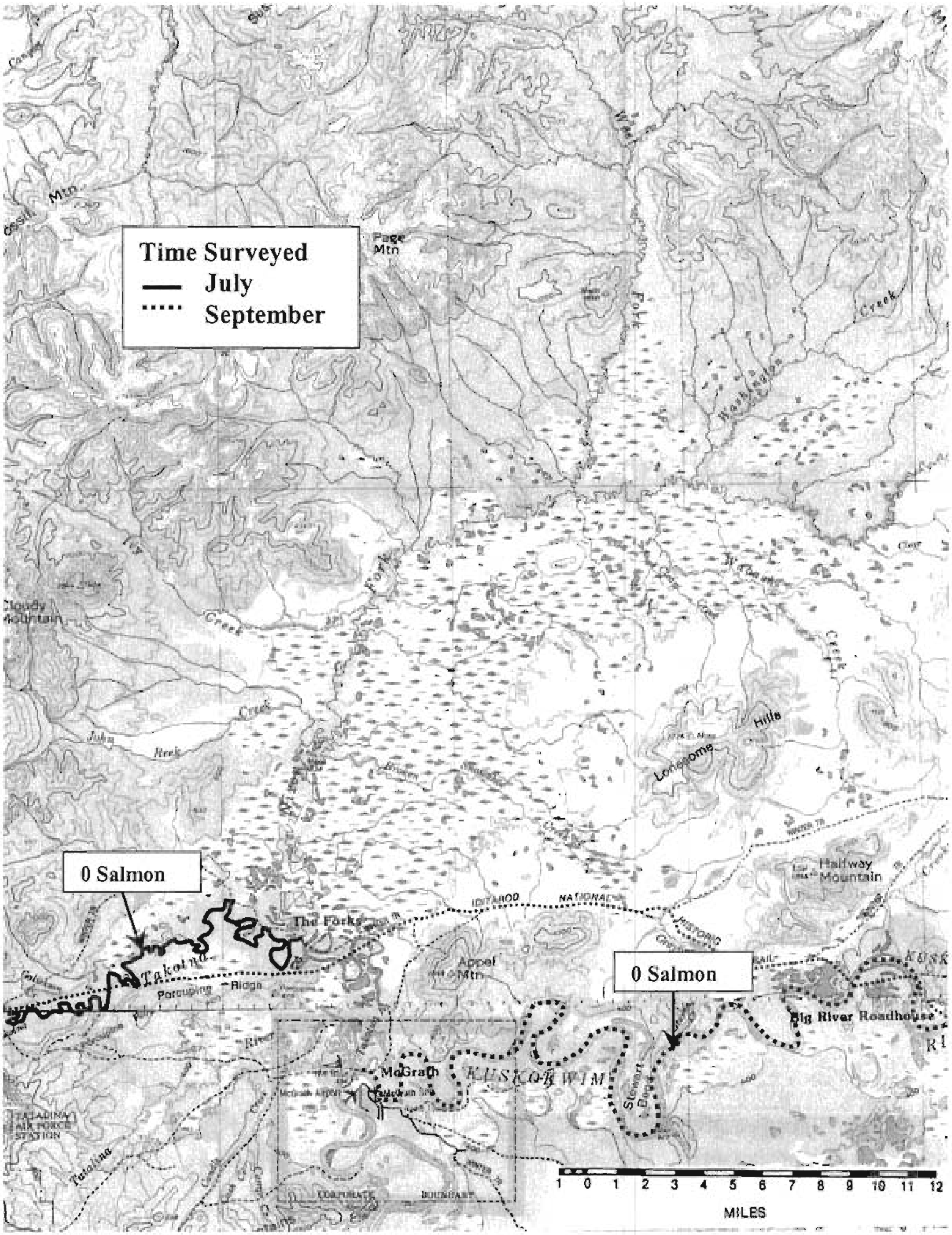

Figure 10. Aerial survey streams: Lower Takotna and upper Kuskokwim Rivers.

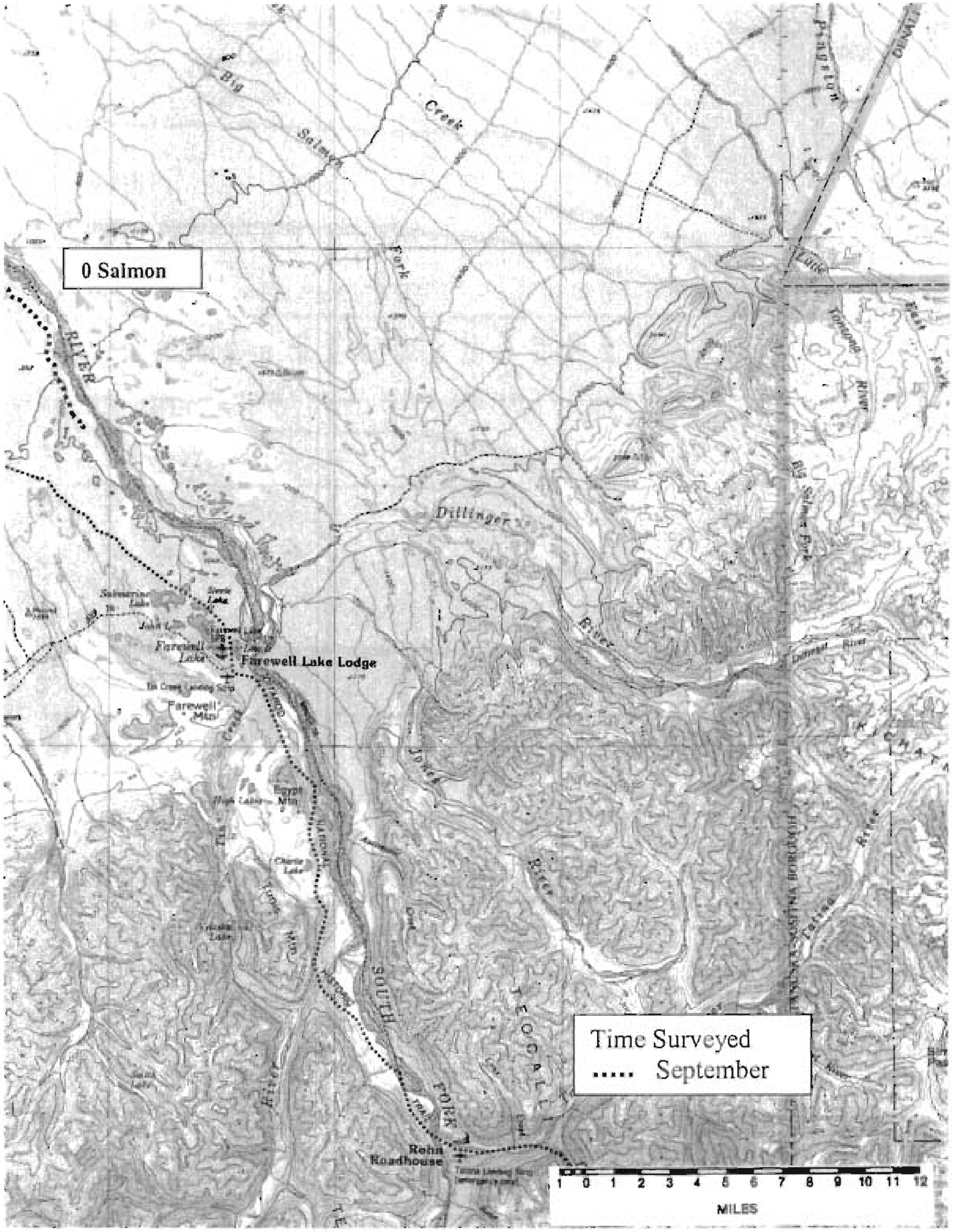

Figure 11. Aerial survey streams: South Fork Kuskokwim River.

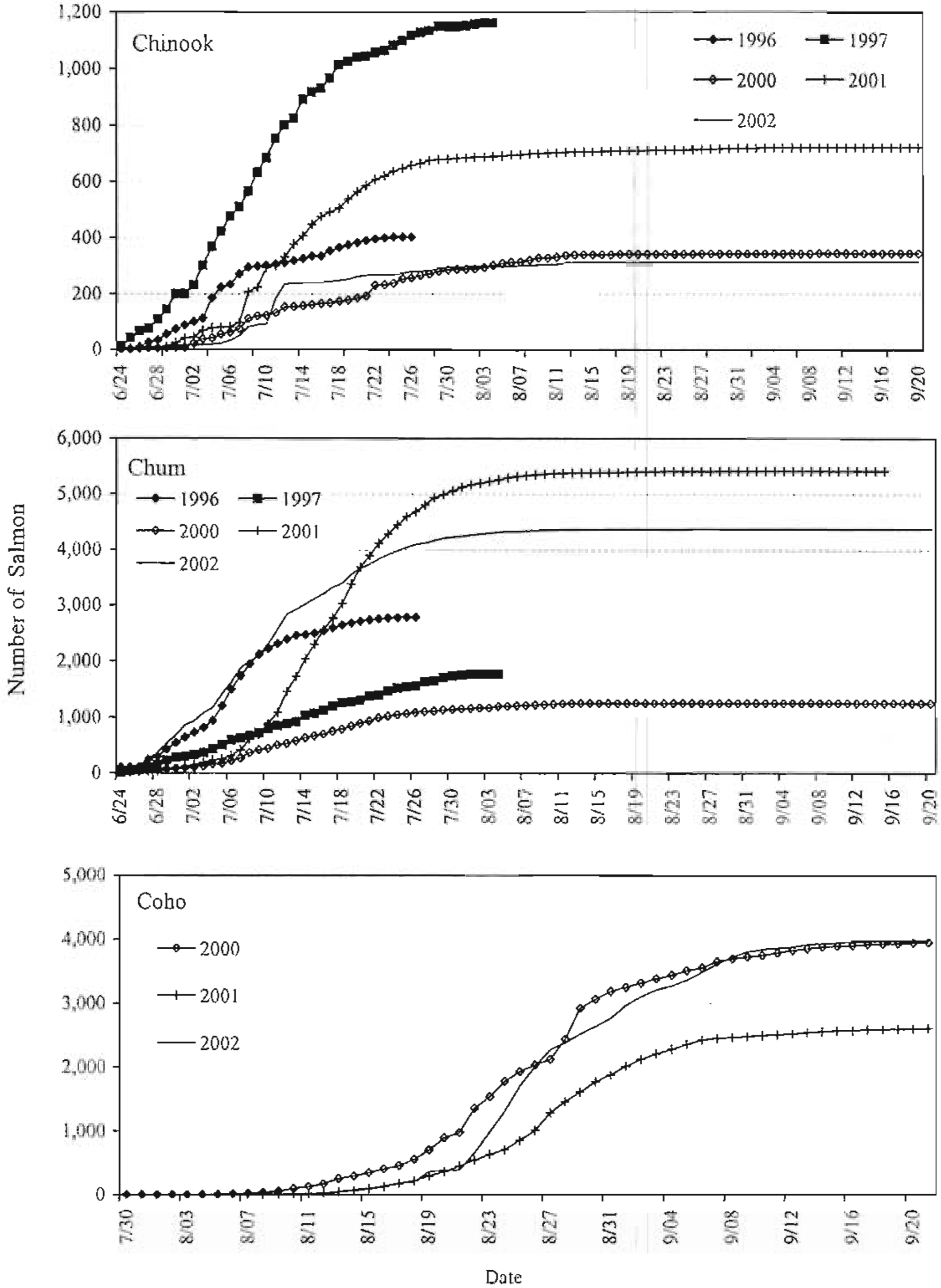

Figure 12. Historical cumulative passage of chinook, chum, and coho salmon past the Takotna tower (1996 and 1997) and weir (2000 to 2002).

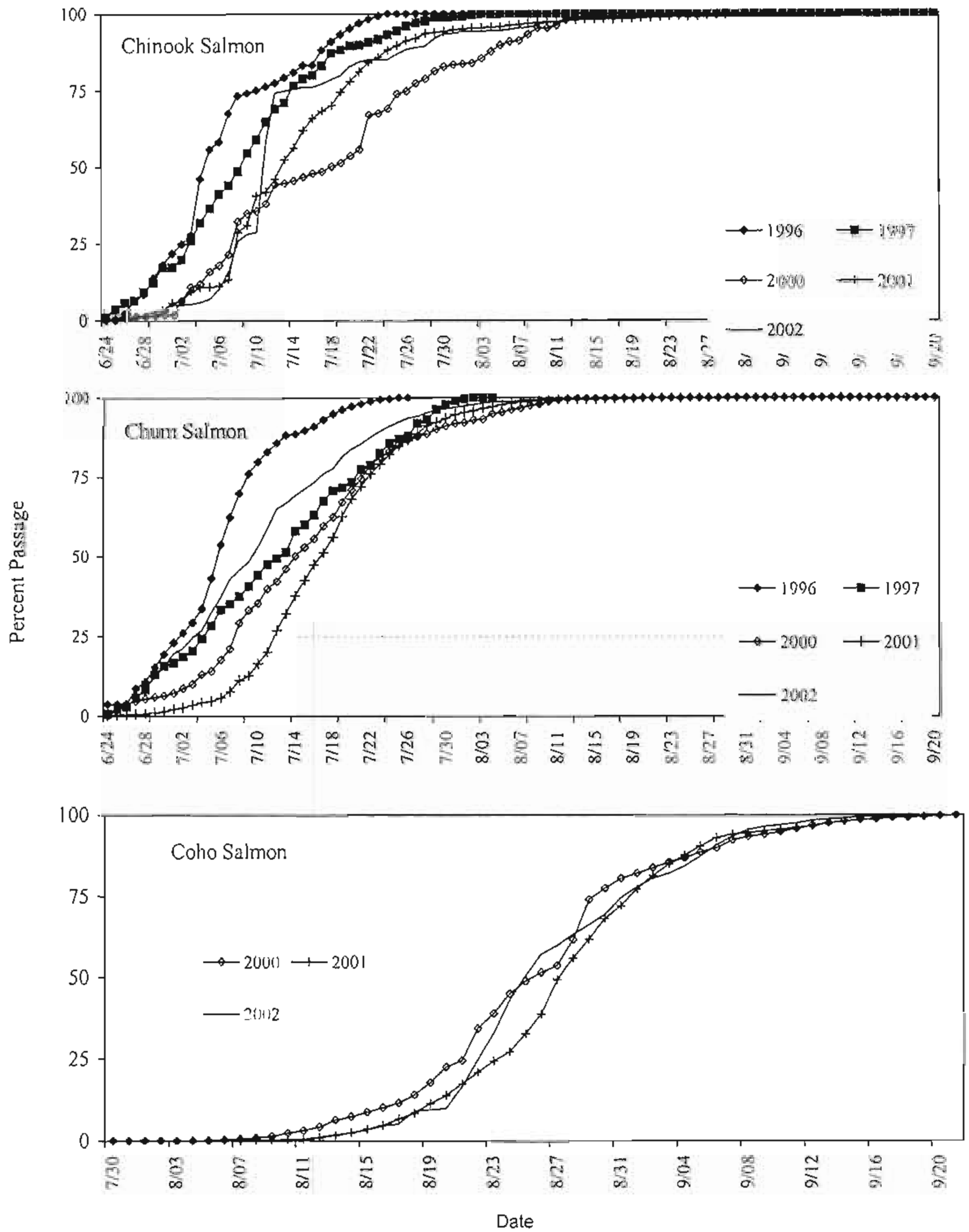

Figure 13. Historical cumulative percent passage of chinook, chum, and coho salmon past the Takotna River tower (1996 and 1997) and weir (2000 to 2002).

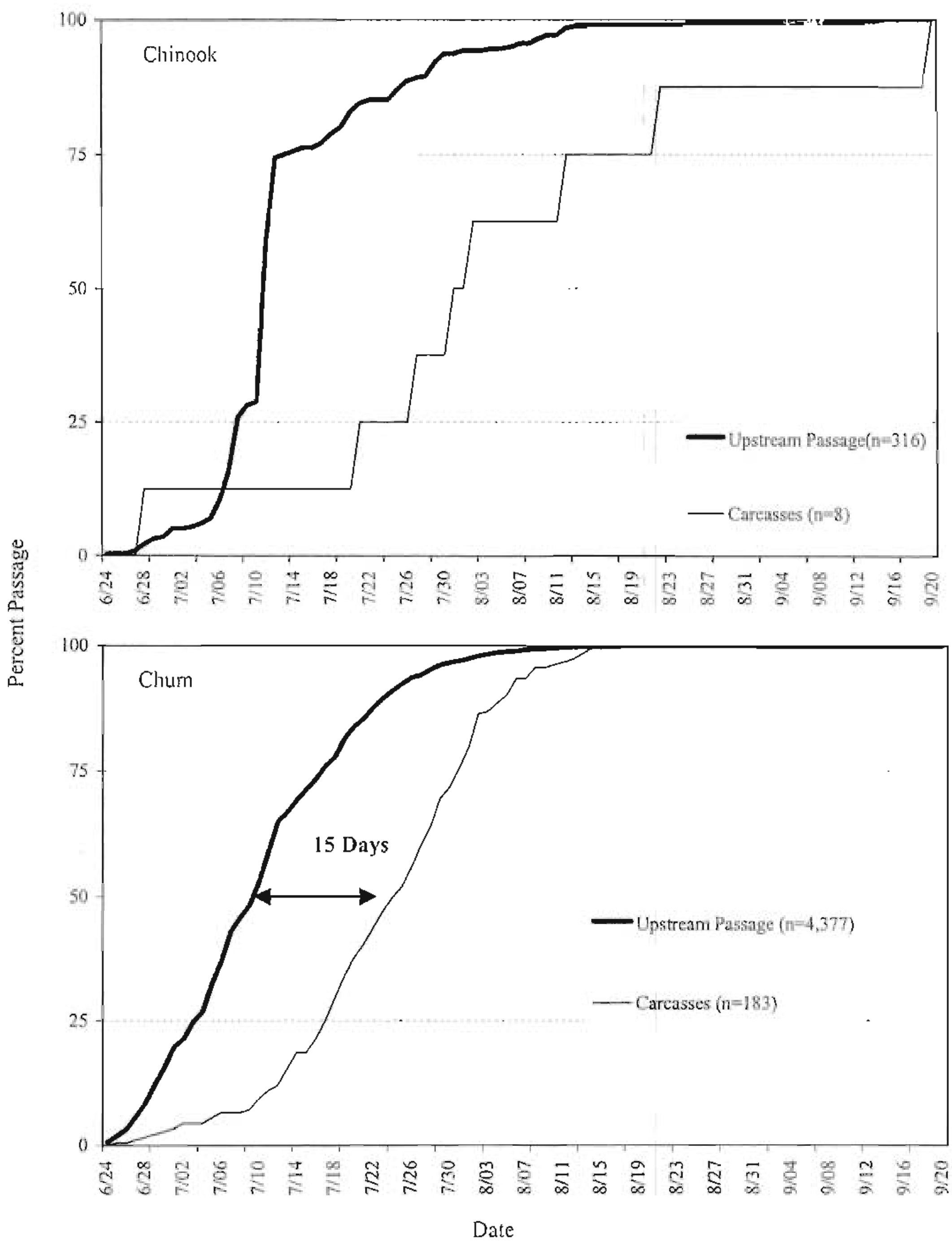

Figure 14. Comparison of cumulative upstream salmon passage (%) and downstream carcass passage (%) by species at the Takotna River weir, 2002.

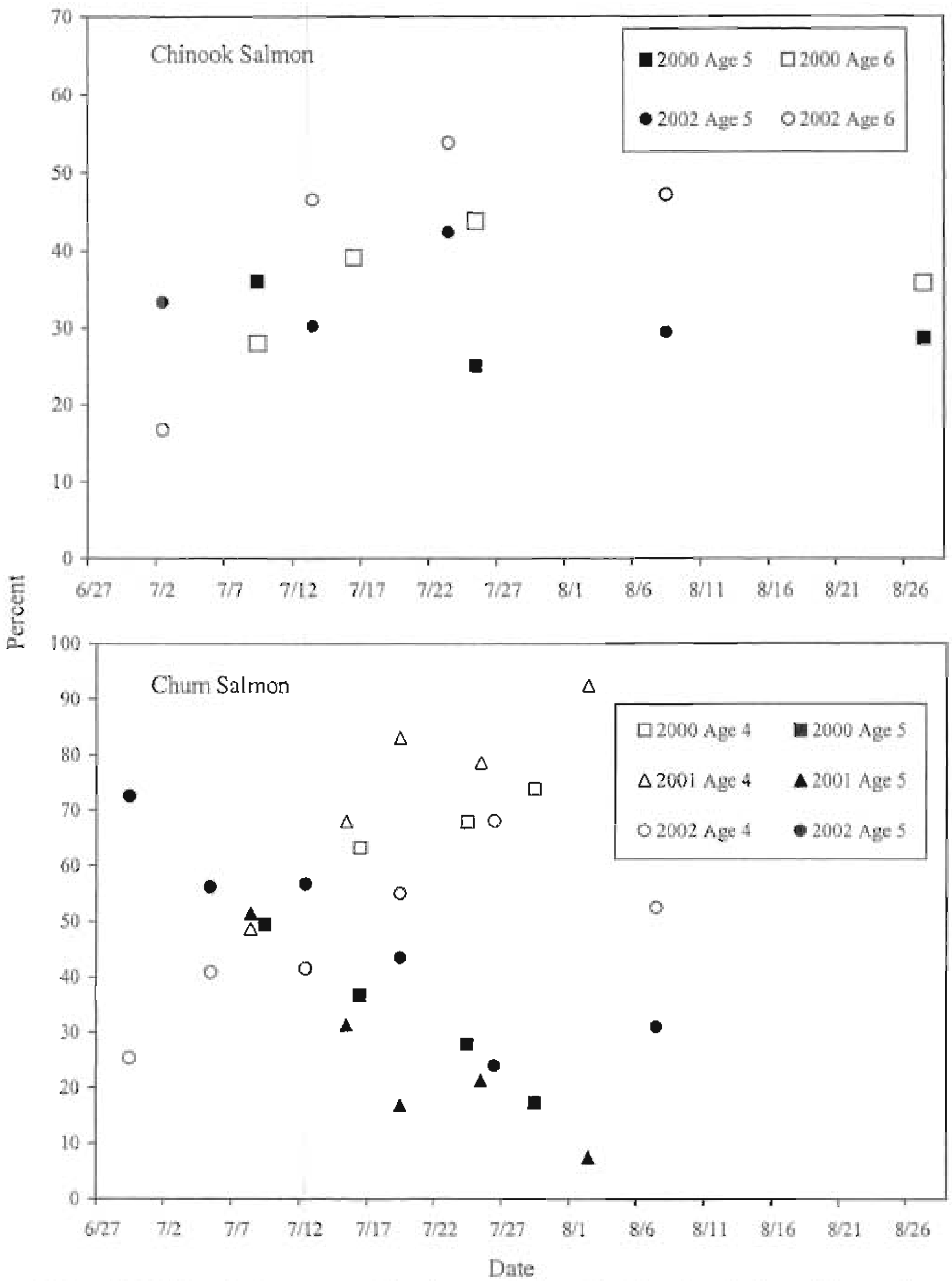

Figure 15. Historical age composition by sample date for chinook and chum salmon at the Takotna River weir, 2002.

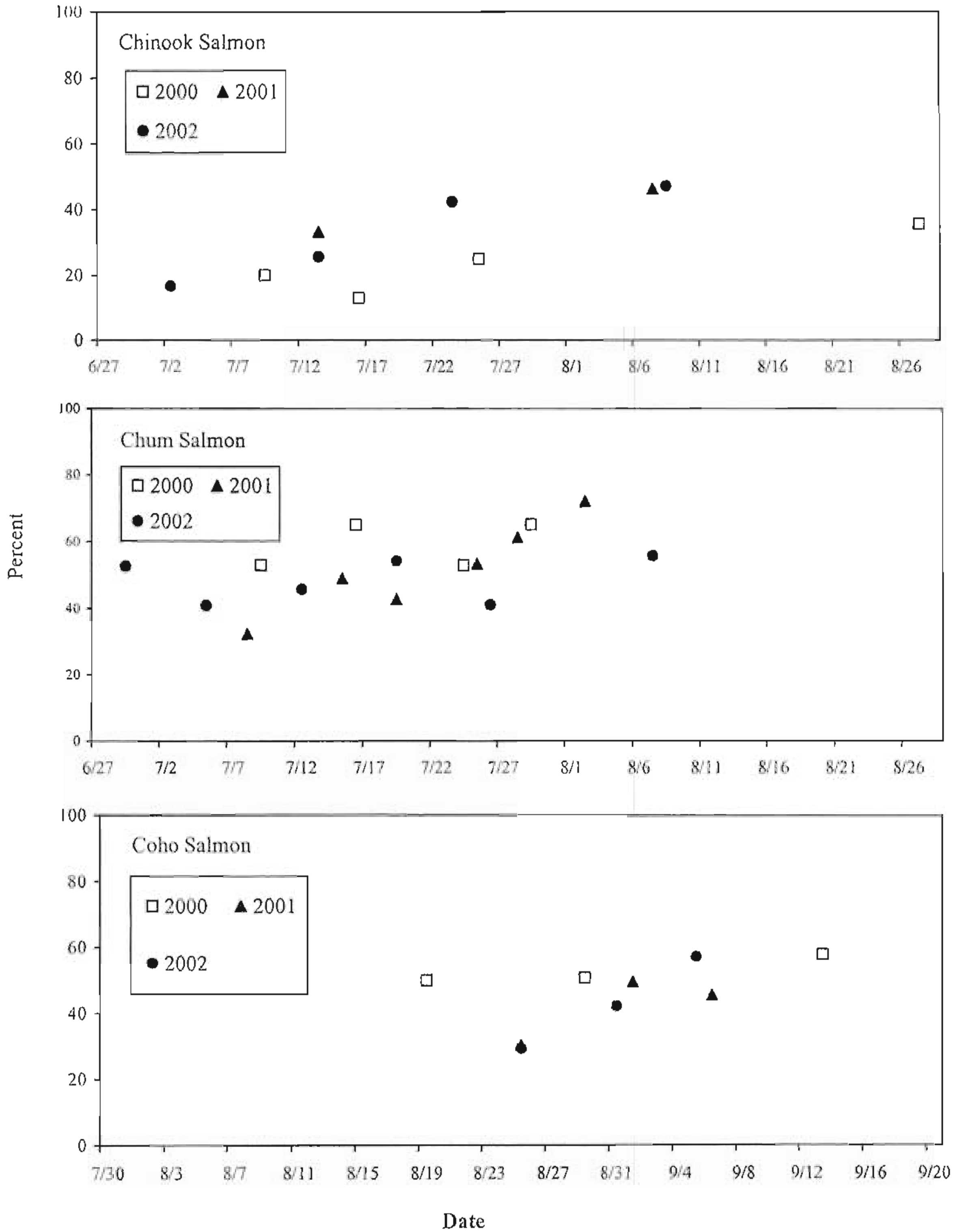

Figure 16. Historical percentage of female chinook, chum and coho salmon, by sample date, at the Takotna River weir, 2002.

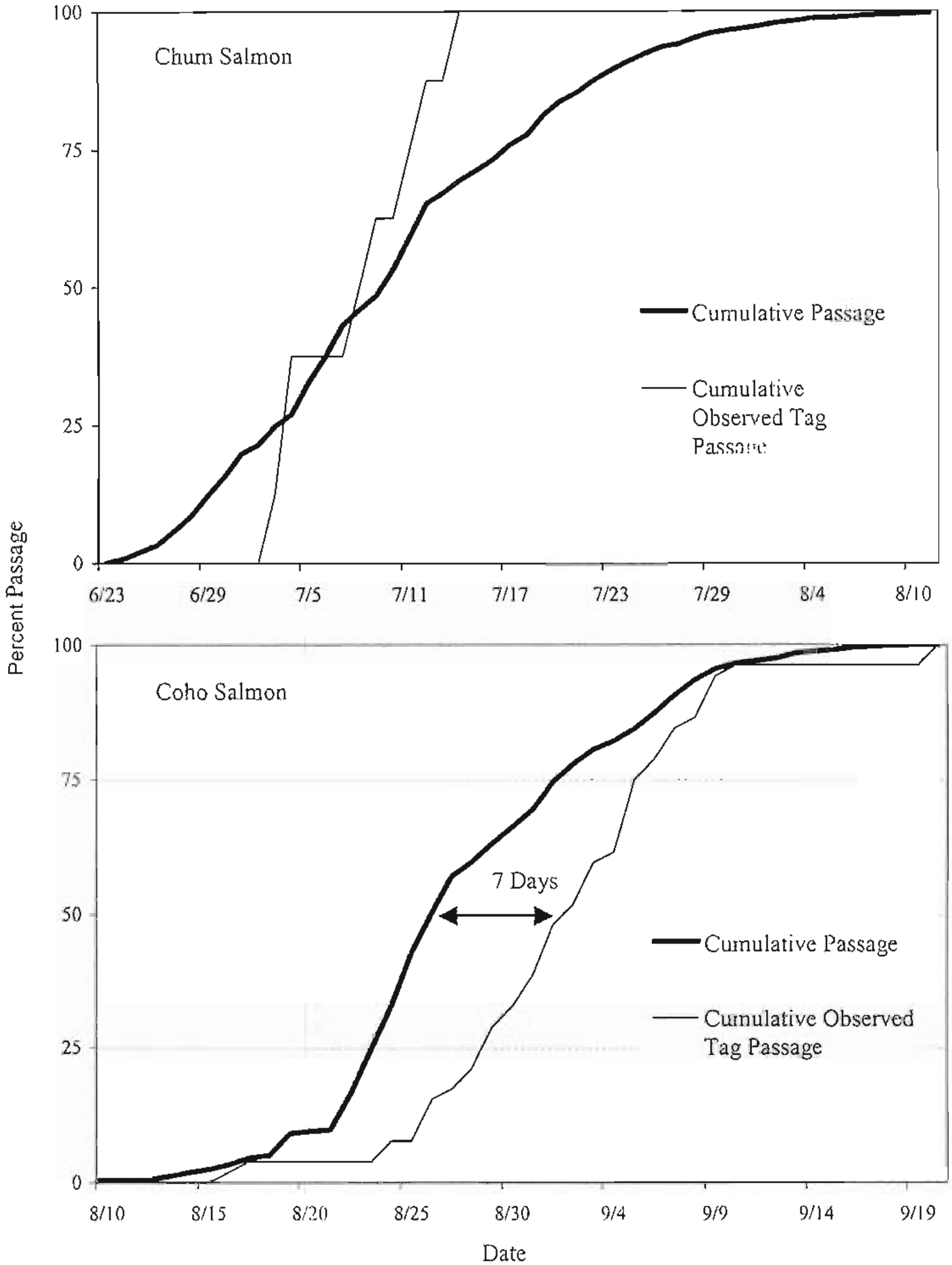

Figure 17. Cumulative percent passage of total observed passage and observed tag passage for chum and coho salmon at the Takotna River weir by date, 2002.

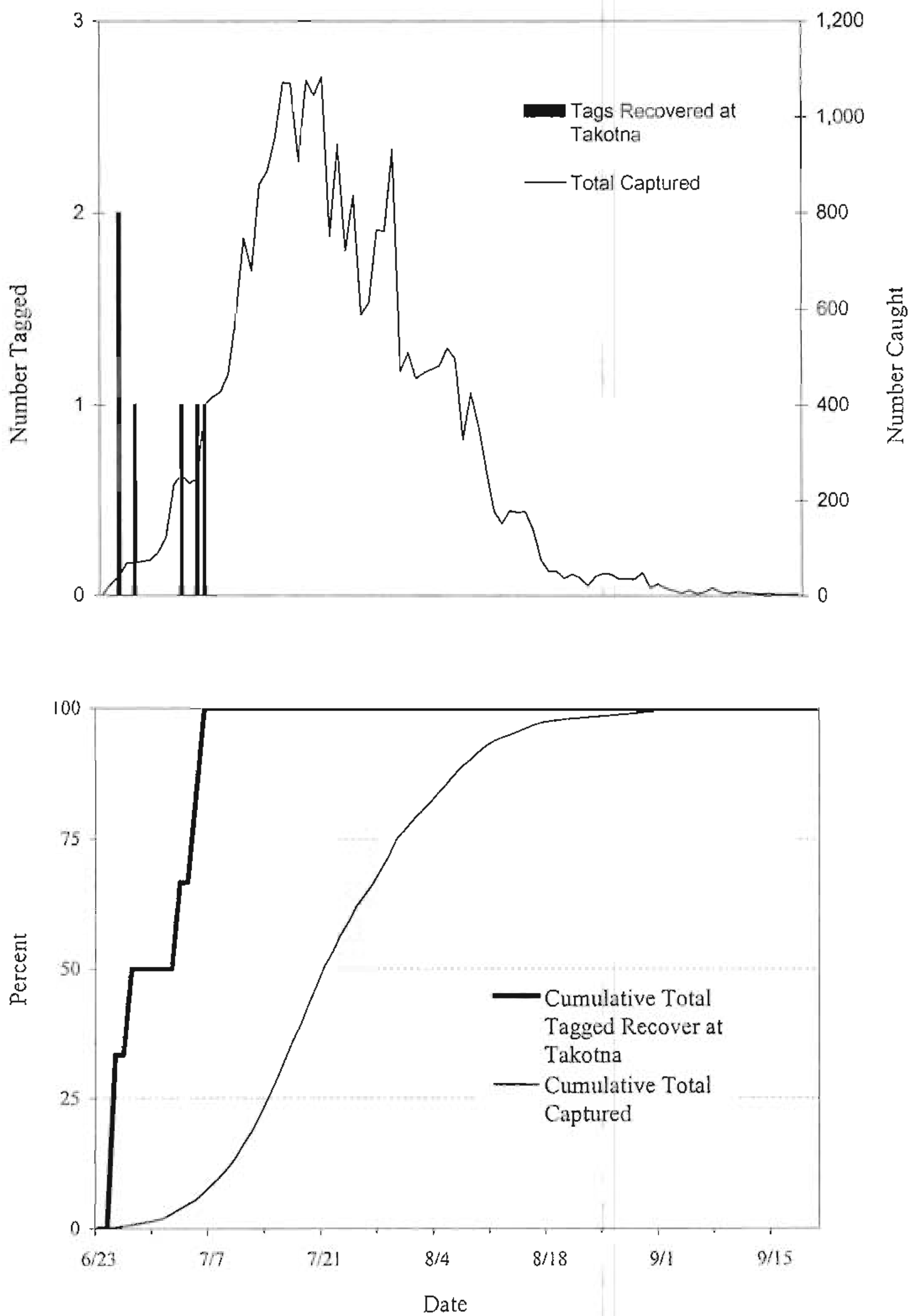

Figure 18. Chum salmon captured at Kalskag and Birch Tree Crossing, by date, compared to chum salmon recovered at the Takotna River weir, by date tagged, 2002.

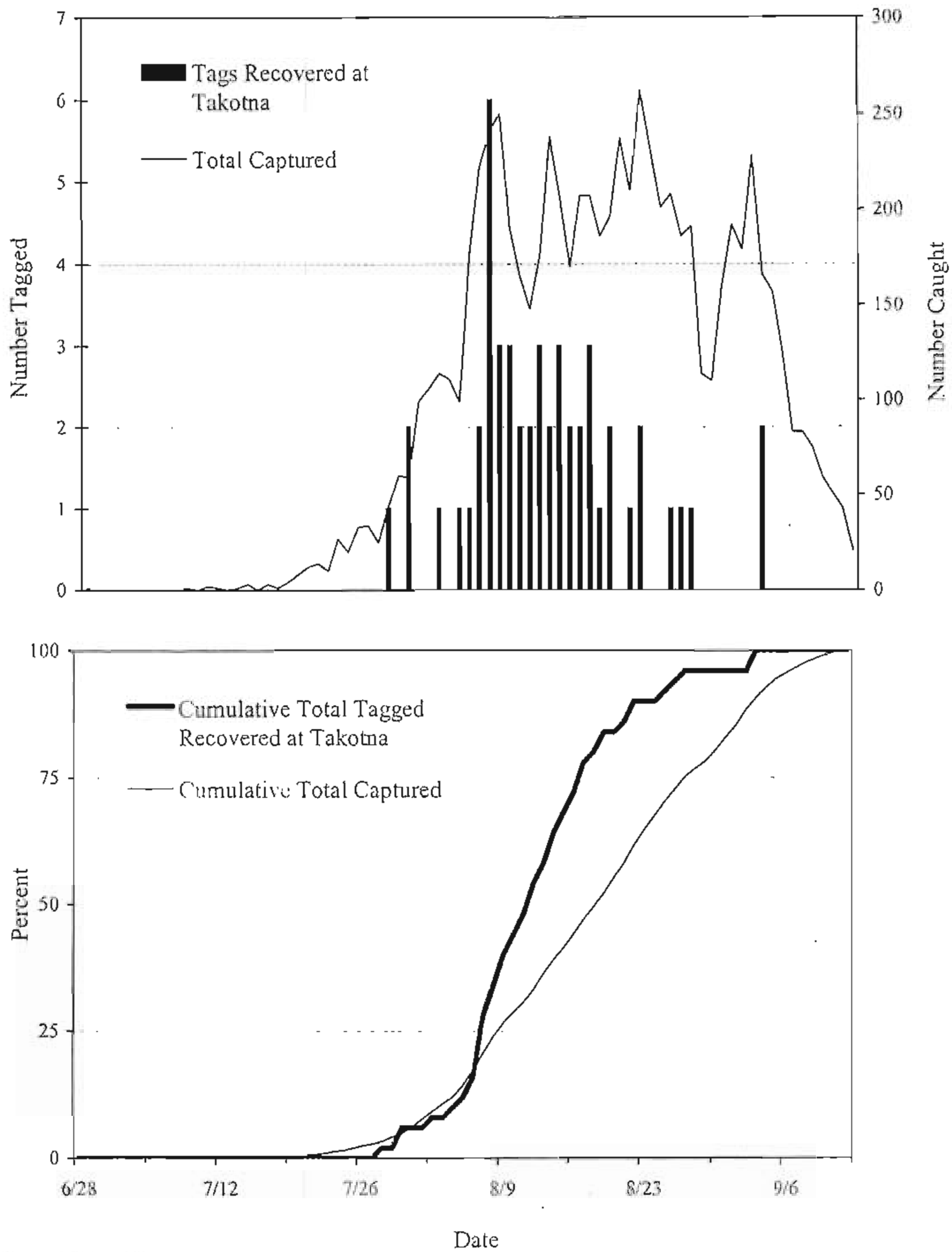

Figure 19. Coho salmon captured at Kalskag and Birch Tree Crossing, by date, compared to coho salmon recovered at the Takotna River weir, by date tagged, 2002.

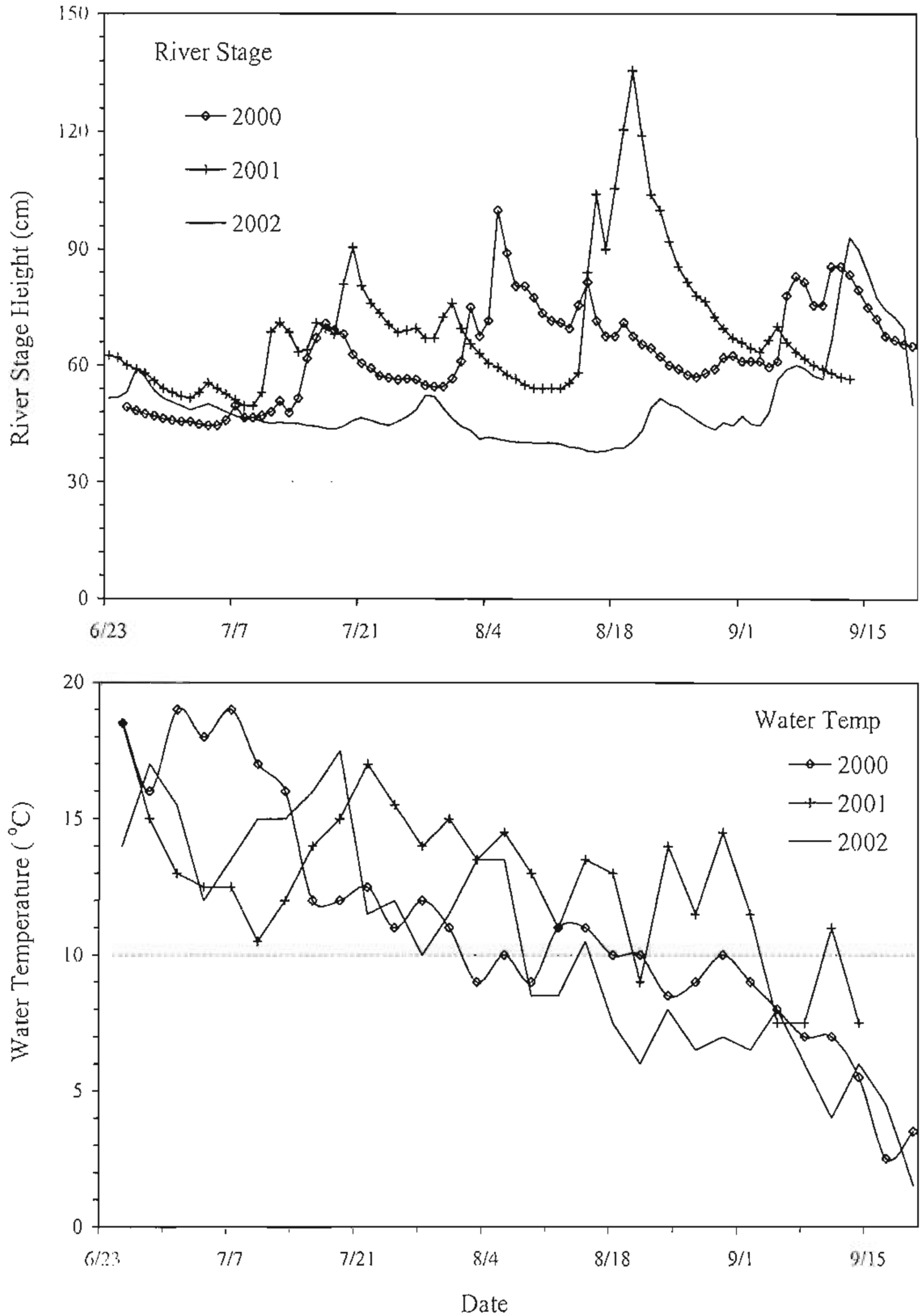

Figure 20. Daily average river stage and water temperature collected at the Takotna River weir from 2000 to 2002.

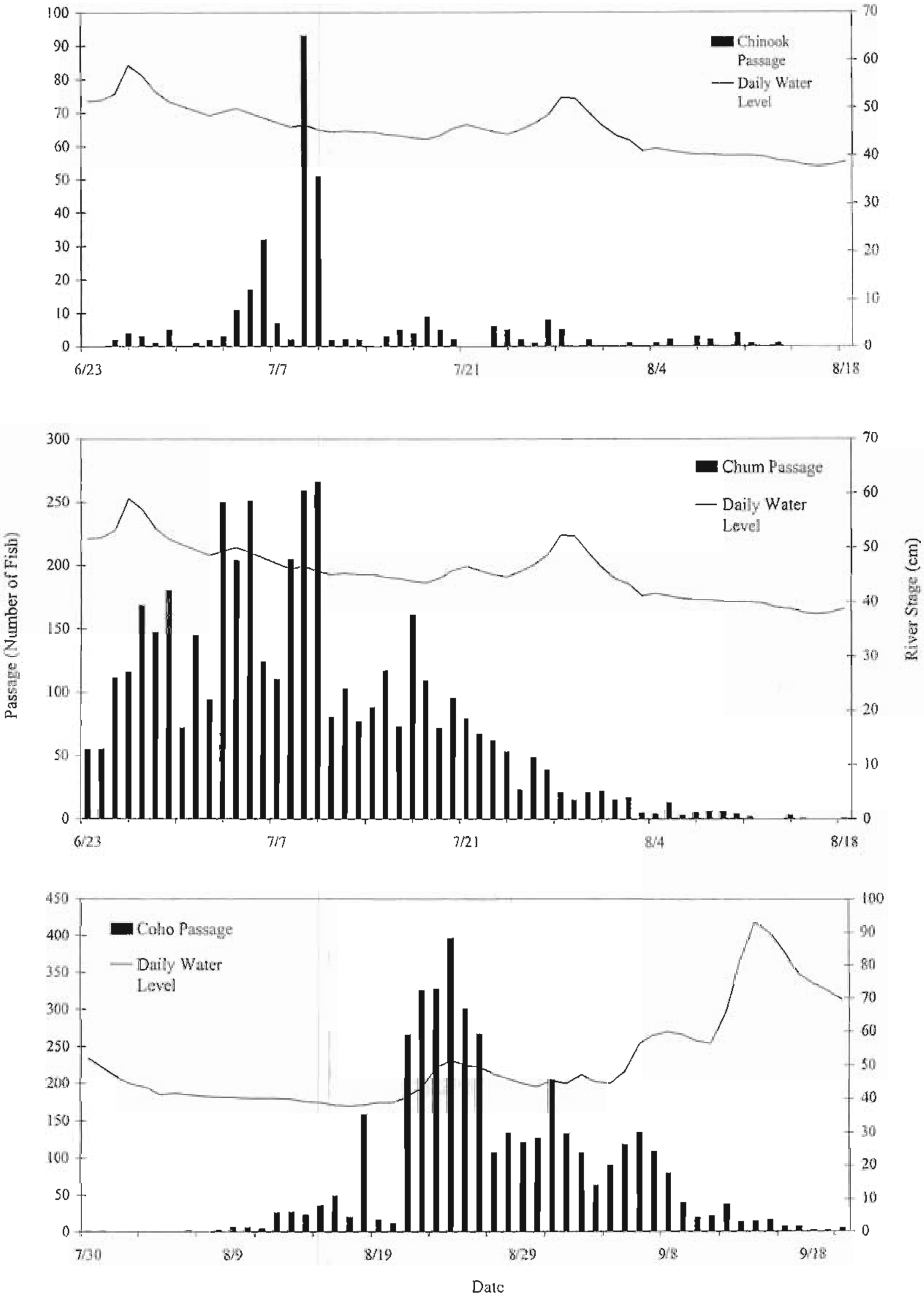

Figure 21 Daily chinook, chum and coho salmon passage at the Takotna River weir relative to river stage height, 2002.

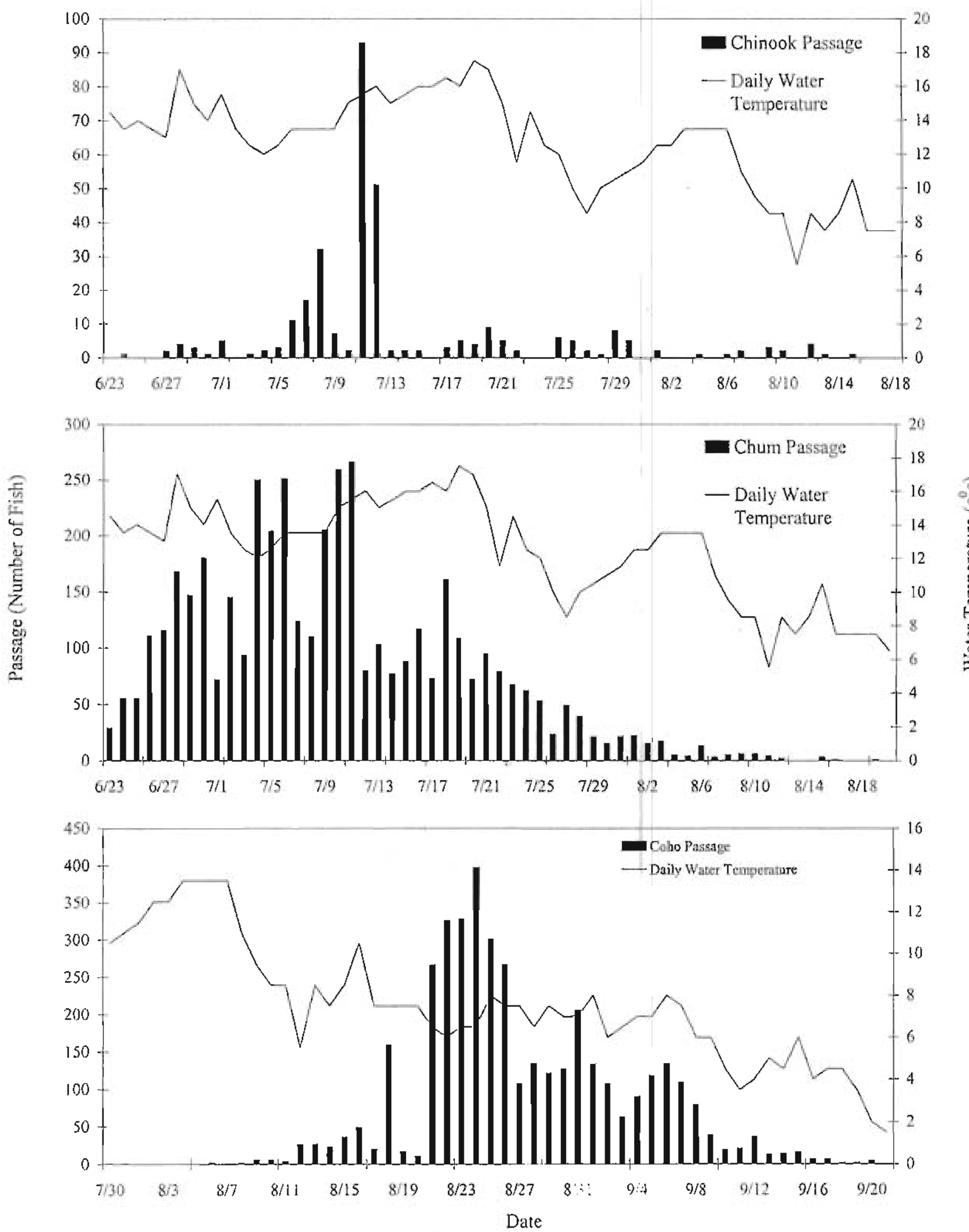

Figure 22. Daily chinook, chum and coho salmon passage at the Takotna River weir relative to water temperature, 2002.

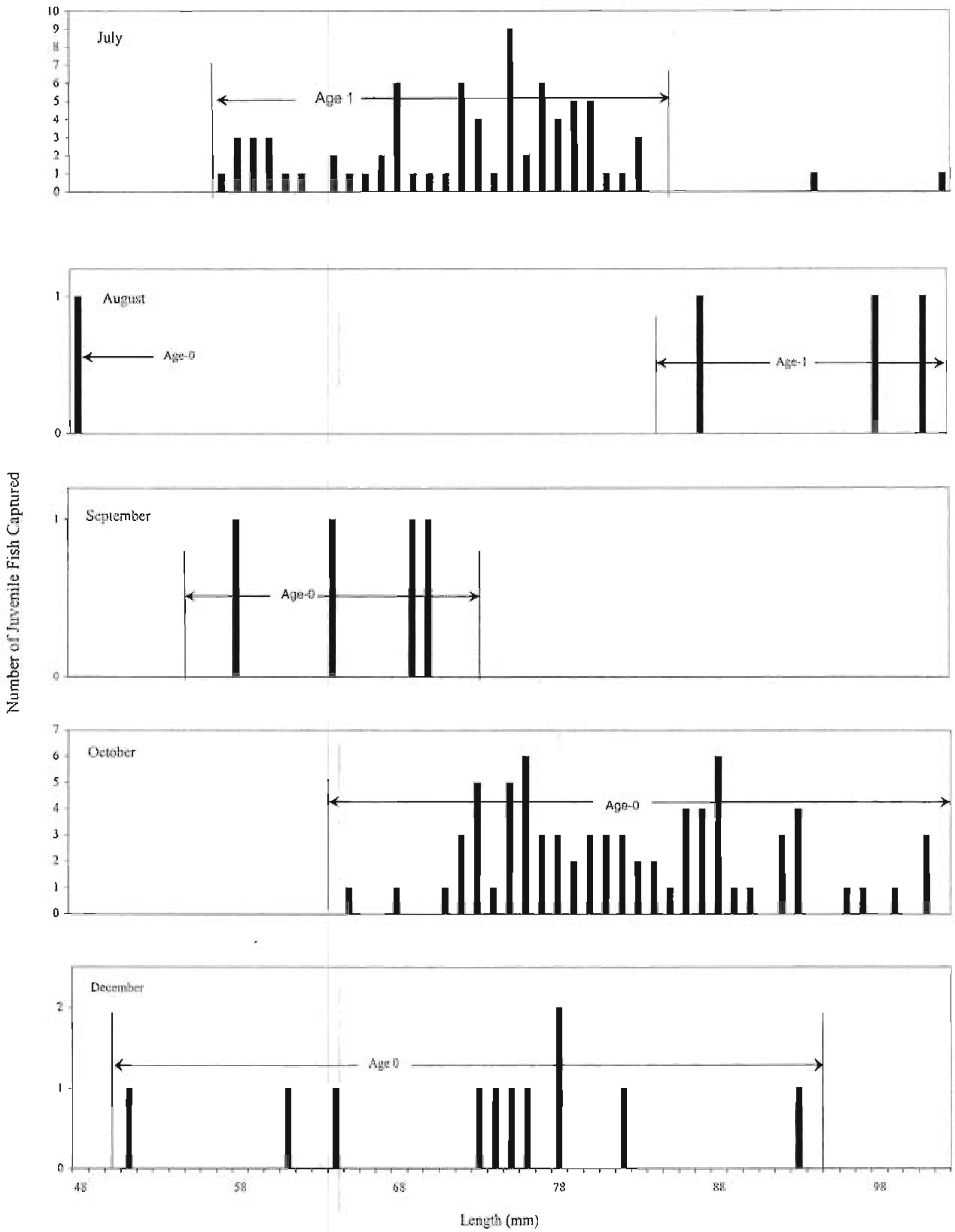

Figure 23. Trap caught juvenile chinook salmon in the Takotna River drainage, 2002.

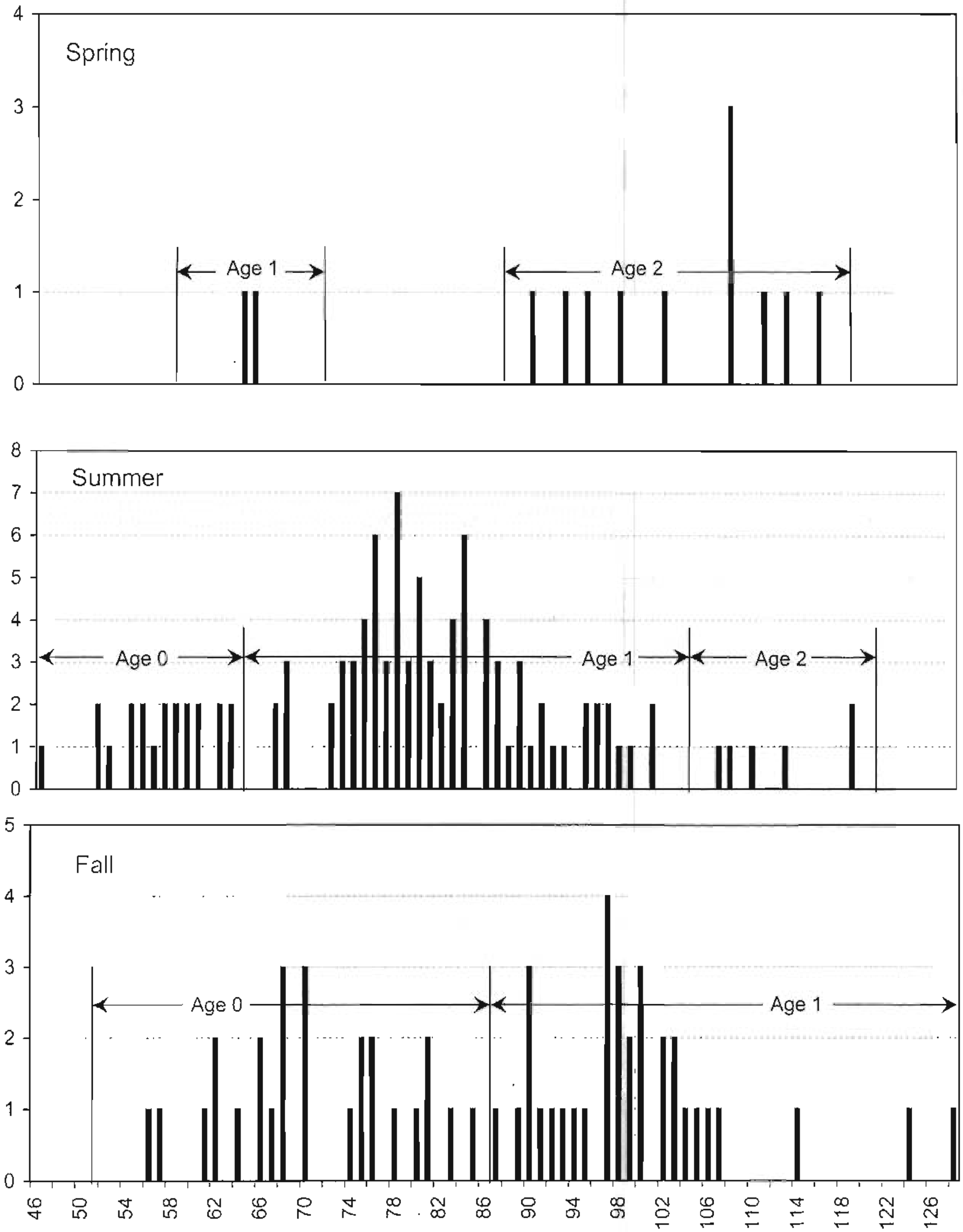

Figure 24. Trap caught juvenile coho salmon lengths by season, 2002.

APPENDIX A

FORMS USED BY THE TAKOTNA RIVER WEIR CREW, 2002

Appendix A.1. ASL field sampling form.

ASL Sampling Field Form

Location: ______________________ Species: ____________________ Date: ____________

Crew: ______________________________ Trap Opened/Closed: ____________________

No.	Card No.	Letter A, B...	Sex		Length (mm)	Tag No.	Tag Color	AD Punch	Fish Color	Comments
			M	F						

-Continued-

HEADER KEY

Label

No.: Fish Number (Example: 1, 2, 3, etc…)

Card No.: Card Number (Example: 001, 002, etc…)

Letter: Card Number Letter Designation (A, B, C, or D)

Sex: Sex of Fish = M for Male, F for Female (M on left side, F on right side of column)

Length: Mid-Eye to Fork of Tail (MEF) measurement to nearest 1 mm

Tag No.: Tag Number = 1 through 21,000

Tag Color: Color Code (GM = Green Monofilament), (YM = Yellow Monofilament), (O = Orange), (Y = Yellow)

AD Punch: Hole Punched in Adipose Fin? = (Y = Yes), (N = No)

Fish Color: Fish Coloration = (1 = Silver), (2 = Silver with Color), (3 = Dark Color), (4 = Deep Color, Spawning Coloration)

Comments: Any Noticeable Characteristics (Example: fungus on head, net marks, claw marks)

Appendix A.2. Tag recover form.

Tag Recovery Data Entry Form

Page ____ of ____

Weir Location: ______________________

Crew: ______________________

Date (MMDD)	Species	Tag Information				Sample Type	Comments
		Tag No.	Tag Color	Adipose Punch	Fish Color		

HEADER KEY

Date (MMDD)	**Data** = Calendar MMDD, year will be generated if needed
Species	**Species** = Chum, Sockeye, Coho or Chinook Salmon (please do not abbreviate).
Tag No.	**Tag Number** = 1 through 21,000 or TNR=Tag number not recovered
Tag Color	**Tag Color** = (P=Pink Tag), (G=Green Tag), (W=White Tag), (B=Blue Tag), (GMono=Green Monofilament), (O=Orange),(Y=Yellow)
Adipose Punch	**Adipose Punch** = (Y = yes), (N = no)
Color	**Fish Color** = (1=silver), (2=silver with color), (3=dark color), (4=deep color, spawning coloration)
Sample Type	**Sample Type** = (A=Active Samples), (B=Examined Samples), (ASL=Age, Sex and Length Samples)
Comments	

Instructions	This data will be used to determine run timing and migration rates. All tag information should appear on this form. Please follow the following instruction for entering data : 1) under TAG NO. enter the tag number or **TNR** if a fish bearing a tag and pass
Season End	**Please Mail completed data form to the following address: ADF&G-CF, attn. Carol Kerkvliet; 333 Raspberry Rd. , Anchorage, AK. 99518.**
Questions?	**From June through Sept. 10, call Carol Kerkvliet in Kalskag at 471-2467, after Sept. 10 call her at 267-2379.**

Appendix A.3. Daily summary of tagged and untagged fish form.

Daily Summary of Tagged and Untagged Salmon Counted Past Weir

Page ____ of ____ Weir Location: ____________

Species: Crew: ____________

Date (MMDD)	Total Number of Tags Recovered by Tag Color							No. of Tags Pass Weir	No. Untagged Fish Pass Weir	Total Fish Passed	Comments
	Pink	Green	White	Blue	Green Mono.	Fl. Yellow	Fl. Orange				

HEADER KEY	
Date (MMDD)	Data = Calendar MMDD, year will be generated if needed
Tag Color	Tag Color = (P=Pink Tag), (G=Green Tag), (W=White Tag), (B=Blue Tag), (GMono=Green Monofilament), (O=Fluorescent Orange),(Y=Fluorescent Yellow).
No. of Tags Pass Weir	No. of Tags Pass Weir = Sum of all tags recovered
No. Untagged Fish Pass Weir	No. Untagged Fish Pass Weir= Sum of fish with out tags that passed through the weir.
Total Fish Passed	Total Fish Passed = Total Number of Tags Pass Weir + Total No. Untagged Fish Pass Weir
Comments	
Instructions	This data can be used to generate a population estimate and determine tag:untagged ratios. Please use a separate sheet for each species.
Season End	Please Mail completed data form to the following address: ADF&G-CF, attn. Carol Kerkvliet; 333 Raspberry Rd. , Anchorage, AK. 99518.
Questions?	From June through Sept. 10, call Carol Kerkvliet in Kalskag at 471-2467, after Sept. 10 call her at 267-2379.

Appendix A.4. Daily summery of fish examined for secondary marks form.

Daily Summary Form for Salmon Examined for Adipose Hole Punches

Page _____ of _____ **Weir Location:** ____________

Species: **Crew:**

Week	Date (MMDD)	Tag Colors							Total No. of Fish with Tags	No. of Fish Adipose Punch and No Tag	Total No. of Fish Examined	Sample Type	Comments
		Pink	Green	White	Blue	Green Mono.	Fl. Yellow	Fl. Orange					

HEADER KEY

Week	Week = Weeks begin on Sunday and ends on Saturday. Number weeks 1 to n.
Date (MMDD)	Data = Calendar MMDD, year will be generated if needed
Tag Color	Tag Color = (P=Pink Tag), (G=Green Tag), (W=White Tag), (B=Blue Tag), (GMono=Green Monofilament), (FLO=Flourescent Orange),(FLY=Flourescent Yellow).
No. of Fish with Tags	No. of Fish with Tags = Sum of all tags recovered
No. of Fish Adipose Punch and No Tag	No. of Fish Adipose Punch and No Tag= Sum of fish with out tags but with holes in adipose fin.
Total No. of Fish Examined	Total No. of Fish Examined = Sum of all fish examined (this includes fish that have tags, and fish that do not have tags but have holes in adipose fin.
Sample Type	Sample Type = (E=Examined Samples), (ASL=Age, Sex and Length Samples)
Comments	

Instructions	The purpose of this data is to determine tag loss. This is accomplished by marking each fish with a secondary mark. The secondary mark we use is punching a hole in the adipose fin by using a paper punch. If a fish has a hole in the adipose but does not
Season End	Please Mail completed data form to the following address: ADF&G-CF, attn. Carol Kerkvliet; 333 Raspberry Rd. , Anchorage, AK. 99518.
Questions?	From June through Sept. 10, call Carol Kerkvliet in Kalskag at 471-2467, after Sept. 10 call her at 267-2379.

Appendix A.5. Daily fish counts and climate information form.

Takotna River Weir Daily Counts

Date	Time		# Sampled	# Examined	Total passage		
		Chinook				Water Temp	
		Chum				Air Temp	
		Coho				Water Depth	
		Sucker				Cloud Cover	
		Other				Precipitation	
		Mortality				Wind/Direction	

Date	Time		# Sampled	# Examined	Total passage		
		Chinook				Water Temp	
		Chum				Air Temp	
		Coho				Water Depth	
		Sucker				Cloud Cover	
		Other				Precipitation	
		Mortality				Wind/Direction	

Date	Time		# Sampled	# Examined	Total passage		
		Chinook				Water Temp	
		Chum				Air Temp	
		Coho				Water Depth	
		Sucker				Cloud Cover	
		Other				Precipitation	
		Mortality				Wind/Direction	

Date	Time		# Sampled	# Examined	Total passage		
		Chinook				Water Temp	
		Chum				Air Temp	
		Coho				Water Depth	
		Sucker				Cloud Cover	
		Other				Precipitation	
		Mortality				Wind/Direction	

Date	Time		# Sampled	# Examined	Total passage		
		Chinook				Water Temp	
		Chum				Air Temp	
		Coho				Water Depth	
		Sucker				Cloud Cover	
		Other				Precipitation	
		Mortality				Wind/Direction	

APPENDIX B

AERIAL SURVEY INFORMATION FOR THE MIDDLE AND UPPER KUSKOKWIM RIVER DRAINAGE, 2002

Appendix B.1. Aerial survey coordinates for selected upper and middle Kuskokwim River tributaries.

Lat.	Long.	Abreviation	River and System
62 39 00	157 00 00	Jul-01	Forth of July Creek Head waters (Takotna)
62 50 11	156 20 64	Jul-02	Forth of July Creek Mouth (Takotna)
62 36 21	157 08 85	Mo 1	Morre Creek Head Waters (Takotna)
62 32 30	156 47 50	Mo 2	Morre Creek Mouth (Takotna)
62 28 00	156 51 00	Lw 1	Little Waldren Creek Head Waters (Takotna)
62 32 30	156 47 50	Lw 2	Little Waldren Creek Mouth (Takotna)
62 34 49	156 33 78	Bw 1	Big Waldren Creek Head Waters (Takotna)
62 38 16	156 34 29	Bw 2	Big Waldren Creek Mouth (Takotna)
62 55 00	156 27 00	Big 1	Big Creek Head Waters (Takotna)
62 50 72	156 19 74	Big 2	Big Creek Mouth (Takotna)
62 27 82	157 11 44	Geo 1	George River Head Waters
61 55 26	157 42 00	Geo 2	George River Mouth (Weir Site)
62 05 94	155 25 21	Tat 1	Tat River Head Waters
61 56 04	156 11 31	Tat 2	Tat River Mouth (Weir site)
62 52 03	154 30 27	Sr 1a	Salmon River Index Area 101 End
62 53 45	154 34 86	Sr 1b	Salmon River Index Area 101 Start
62 52 30	154 52 30	Sr 2a	Salmon River Index Area 102 End
62 52 03	154 30 27	Sr 2b	Salmon River Index Area 102 Start
62 51 62	154 19 82	Sr 3a	Salmon River Index Area 103 End
62 53 11	154 28 93	Sr 3b	Salmon River Index Area 103 Start
62 52 66	154 28 84	Sr 4a	Salmon River Index Area 104 End
62 52 03	154 30 27	Sr 4b	Salmon River Index Area 104 Start
62 48 24	154 13 66	Brc 1	Bear Creek Head Waters (Pitka)
62 51 08	154 32 94	Brc 2	Bear Creek Mouth (Pitka)
62 44 57	154 14 60	Sul 1	Sulivan Creek Head Waters (Pitka)
62 48 02	154 30 28	Sul 2	Sulivan Creek Mouth (Pitka)

-Continued-

Appendix B.1. (Page 2 of 2).

Lat.	Long.	Abreviation	River and System
62 42 97	154 13 66	Shp 1	Sheep Creek Head Waters (Pitka)
62 46 28	154 28 66	Shp 2	Sheep Creek Mouth (Pitka)
62 40 35	154 23 28	Pit 1	Upper Pitka Fork River Head Waters(Pitka)
62 46 28	154 28 66	Pit 2	Upper Pitka Fork River mouth (Pitka)
62 56 62	153 40 69	Lt 1	Little Tonzona Head Waters
62 57 20	154 10 37	Lt 2	Little Tonzona Mouth
62 52 97	153 58 22	Ltt 1	Unnamed Trib. Of The Little Tonzona Head Waters
62 57 89	154 07 43	Ltt 2	Unnamed Trib. Of The Little Tonzona Mouth
62 52 70	153 46 34	Bs 1	Big Salmon River Head Waters
62 57 30	153 55 84	Bs 2	Big Salmon River Mouth
62 28 51	153 22 87	Jon 1	Jones River Head Waters
62 44 19	153 26 14	Jon 2	Jones River Mouth
62 41 76	154 37 21	Mif 1	Middle Fork Un-named Trib Head Water
63 43 68	155 39 81	Mif 2	Middle Fork Un-named Trib Mouth
62 37 97	154 34 04	Wdt 1	Windy River Un-named Trib. Head Water
62 41 89	154 36 35	Wdt 2	Windy River Un-named Trib. Mouth
62 35 54	154 36 35	Win 1	Windy River Head Waters
62 41 89	154 36 35	Wdt 2	Windy River Mouth
62 40 71	154 57 69	Bgr 1	Big River Trib.

APPENDIX C
FISH PASSAGE

Appendix C.1. Historic chinook salmon passage for the Takotna River.

Date	Daily Passage							Cumulative Passage							Percent Passage				
	1995	1996	1997	1998	2000	2001	2002	1995	1996	1997	1998	2000	2001	2002	1996	1997	2000	2001	2002
6/15																			
6/16																			
6/17																			
6/18																			
6/19																			
6/20																			
6/21			0																
6/22[d]			6																
6/23			0			0	0												
6/24			12		0	1	1			12		0	1	1	0	1	0	0	0
6/25		0	30		2	3	0		0	42		2	4	1	0	4	1	1	0
6/26		9	24		2	1	0		9	66		4	5	1	2	6	1	1	0
6/27		17	9		1	4	2		26	75		5	9	3	6	6	1	1	1
6/28		8	33	0	0	1	4		34	108	0	5	10	7	8	9	1	1	2
6/29		21	36	0	1	1	3		55	144	0	6	11	10	14	12	2	2	3
6/30		18	57	0	1	13	1		73	201	0	7	24	11	18	17	2	3	3
7/01		15	0	0	0	17	5		88	201	0	7	41	16	22	17	2	6	5
7/02		12	30	3	15	4	0		100	231	3	22	45	16	25	20	6	6	5
7/03		12	72	3	16	23	1		112	303	6	38	68	17	28	26	11	9	5
7/04		73	66	3	3	10	2		185	369	9	41	78	19	46	32	12	11	6
7/05		39	54	12	14	1	3		224	423	21	55	79	22	56	36	16	11	7
7/06		10	54		7	3	11		234	477		62	82	33	58	41	18	11	10
7/07		37	33		12	15	17		271	510		74	97	50	67	44	21	13	16
7/08		24	54		37	110	32		295	564		111	207	82	73	49	32	29	26
7/09		3	69		9	17	7		298	633		120	224	89	74	55	35	31	28
7/10		4	51		3	69	2		302	684		123	293	91	75	59	36	41	29
7/11		5	69		8	9	93		307	753		131	302	184	76	65	38	42	58
7/12		5	48		22	30	51		312	801		153	332	235	78	69	44	46	74
7/13		7	24		1	45	2		319	825		154	377	237	79	71	45	52	75
7/14		7	66		3	29	2		326	891		157	406	239	81	77	46	56	76
7/15		9	27		4	41	2	e	335	918		161	447	241	83	79	47	62	76
7/16		0	12		4	28	0		335	930		165	475	241	83	80	48	66	76
7/17		20	36		2	17	3		355	966		167	492	244	88	83	48	68	77
7/18		11	48		6	14	5		366	1,014		173	506	249	91	87	50	70	79
7/19		9	12		4	31	4		375	1,026		177	537	253	93	88	51	74	80
7/20		8	15		8	26	9		383	1,041		185	563	262	95	90	54	78	83
7/21		7	3		7	23	5		390	1,044		192	586	267	97	90	56	81	84
7/22		5	12		39	21	2		395	1,056		231	607	269	98	91	67	84	85
7/23		4	9		2	13	0		399	1,065		233	620	269	99	92	68	86	85
7/24		3	18		5	17	0		402	1,083		238	637	269	100	93	69	88	85
7/25		0	15		17	10	6		402	1,098		255	647	275	100	95	74	90	87
7/26			18		3	11	5		402	1,116		258	658	280	100	96	75	91	89
7/27			12		9	6	2			1,128		267	664	282	100	97	77	92	89
7/28			6		5	11	1			1,134		272	675	283	100	98	79	94	90
7/29			15		9	3	8			1,149		281	678	291	100	99	81	94	92
7/30			0		5	2	5			1,149		286	680	296	100	99	83	94	94
7/31			0		2	4	0			1,149		288	684	296	100	99	83	95	94
8/01			3		1	1	2			1,152		289	685	298	100	99	84	95	94
8/02			6		1	3	0			1,158		290	688	298	100	100	84	95	94
8/03			3		5	0	0			1,161		295	688	298	100	100	86	95	94
8/04			0		8	2	1			1,161		303	690	299	100	100	88	96	95
8/05					7	1	0					310	691	299	100	100	90	96	95
8/06					4	4	1					314	695	300	100	100	91	96	95
8/07					1	1	2					315	696	302	100	100	91	97	96
8/08					7	3	0					322	699	302	100	100	93	97	96
8/09					7	1	3					329	700	305	100	100	95	97	97
8/10					0	2	2					329	702	307	100	100	95	97	97
8/11					3	1	0					332	703	307	100	100	96	98	97
8/12					6	2	4					338	705	311	100	100	98	98	98
8/13					2	1	1					340	706	312	100	100	99	98	99
8/14					1	1	0					341	707	312	100	100	99	98	99
8/15					0	0	1					341	707	313	100	100	99	98	99
8/16					0	1	0					341	708	313	100	100	99	98	99
8/17					0	0	0					341	708	313	100	100	99	98	99

-Continued-

Appendix C.1. (Page 2 of 2).

Date	Daily Passage									Cumulative Passage							Percent Passage				
	1995	1996	1997	1998	2000	2001		2002		1995	1996	1997	1998	2000	2001	2002	1996	1997	2000	2001	2002
8/18					2	1		0						343	709	313	100	100	99	98	99
8/19					0	0		0						343	709	313	100	100	99	98	99
8/20					0	1	a	0						343	710	313	100	100	99	98	99
8/21					0	1	b	0						343	711	313	100	100	99	99	99
8/22					0	1	b	0						343	712	313	100	100	99	99	99
8/23					0	1		0						343	713	313	100	100	99	99	99
8/24					0	0		0						343	713	313	100	100	99	99	99
8/25					0	0		1						343	713	314	100	100	99	99	99
8/26					0	1		0						343	714	314	100	100	99	99	99
8/27					1	1		0						344	715	314	100	100	100	99	99
8/28					0	1		0						344	716	314	100	100	100	99	99
8/29					0	1		0						344	717	314	100	100	100	99	99
8/30					0	1		0						344	718	314	100	100	100	100	99
8/31					0	1		0						344	719	314	100	100	100	100	99
9/01					0	0		0						344	719	314	100	100	100	100	99
9/02					0	0		0						344	719	314	100	100	100	100	99
9/03					0	1		0						344	720	314	100	100	100	100	99
9/04					0	1		0						344	721	314	100	100	100	100	99
9/05					0	0		0						344	721	314	100	100	100	100	99
9/06					0	0		0						344	721	314	100	100	100	100	99
9/07					0	0		0	e					344	721	314	100	100	100	100	99
9/08					0	0		0						344	721	314	100	100	100	100	99
9/09					1	0		0						345	721	314	100	100	100	100	99
9/10					0	0		0						345	721	314	100	100	100	100	99
9/11					0	0		0						345	721	314	100	100	100	100	99
9/12					0	0		0						345	721	314	100	100	100	100	99
9/13					0	0		1						345	721	315	100	100	100	100	100
9/14					0	0		0						345	721	315	100	100	100	100	100
9/15					0	0	e	1						345	721	316	100	100	100	100	100
9/16					0	0	e	0						345	721	316	100	100	100	100	100
9/17					0	0	e	0						345	721	316	100	100	100	100	100
9/18					0	0	e	0						345	721	316	100	100	100	100	100
9/19					0	0	e	0						345	721	316	100	100	100	100	100
9/20					0	0	e	0						345	721	316	100	100	100	100	100

a= estimated salmon passage (partial day)

b= estimated salmon passage (whole day)

c= no estimation for missed longnose sucker counts

d= date outside of target operational period (not included in accumulative totals)

e= no estimates for inoperable period

Appendix C.2. Historic chum salmon passage for the Takotna River.

Date	Daily Passage							Cumulative Passage							Percent Passage				
	1995	1996	1997	1998	2000	2001	2002	1995	1996	1997	1998	2000	2001	2002	1996	1997	2000	2001	2002
6/15		0																	
6/16		0																	
6/17		0	0																
6/18		0	0																
6/19		0	0																
6/20		0	0																
6/21[d]		14	6																
6/22		0	0																
6/23[d]		0	0			6	9												
6/24		102	12		1	3	29		102	12		1	3	29	4	1	0	0	1
6/25		0	27		24	9	55		102	39		25	12	84	4	2	2	0	2
6/26		0	12		23	10	55		102	51		48	22	139	4	3	4	0	3
6/27		137	51		11	12	111		239	102		59	34	250	9	6	5	1	6
6/28		58	45	0	9	4	116		297	147	0	68	38	366	11	8	5	1	8
6/29		127	84	0	6	19	168		424	231	0	74	57	534	15	13	6	1	12
6/30		117	48	9	6	20	147		541	279	9	80	77	681	19	16	6	1	16
7/01		101	18	0	10	42	180		642	297	9	90	119	861	23	17	7	2	20
7/02		85	33	15	18	24	72		727	330	24	108	143	933	26	19	9	3	21
7/03		89	33	6	17	47	145		816	363	30	125	190	1,078	29	20	10	4	25
7/04		123	69	3	39	40	94		939	432	33	164	230	1,172	34	24	13	4	27
7/05		264	72	12	12	21	250		1,203	504	45	176	251	1,422	43	28	14	5	32
7/06		295	87		45	60	204		1,498	591		221	311	1,626	54	33	18	6	37
7/07	0	242	33		44	106	251	0	1,740	624		265	417	1,877	62	35	21	8	43
7/08	53	209	42		101	188	124	53	1,949	666		366	605	2,001	70	37	29	11	46
7/09	18	172	57		49	78	110	71	2,121	723		415	683	2,111	76	41	33	13	48
7/10	222	105	63		27	204	205	293	2,226	786		442	887	2,316	80	44	35	16	53
7/11	63	88	60		58	198	259	356	2,314	846		500	1,085	2,575	83	48	40	20	59
7/12	42	78	33		29	372	266	398	2,392	879		529	1,457	2,841	86	49	42	27	65
7/13	98	70	36		49	275	80	496	2,462	915		578	1,732	2,921	88	51	46	32	67
7/14	117	11	117		50	309	103	613	2,473	1,032		628	2,041	3,024	89	58	50	38	69
7/15	82	28	36		35	265	97	a 695	2,501	1,068		663	2,306	3,121	90	60	53	43	71
7/16	126	37	54		33	257	88	821	2,538	1,122		696	2,563	3,209	91	63	56	47	73
7/17	11	58	78		51	206	117	832	2,596	1,200		747	2,769	3,326	93	67	60	51	76
7/18	150	53	57		34	264	73	982	2,649	1,257		781	3,033	3,399	95	71	62	56	78
7/19	189	35	18		59	352	161	1,171	2,684	1,275		840	3,385	3,560	96	72	67	63	81
7/20	42	29	30		50	301	109	1,213	2,713	1,305		890	3,686	3,669	97	73	71	68	84
7/21	129	26	72		43	212	72	1,342	2,739	1,377		933	3,898	3,741	98	77	74	72	85
7/22	72	21	24		53	215	95	1,414	2,760	1,401		986	4,113	3,836	99	79	79	76	88
7/23	79	15	66		33	165	79	1,493	2,775	1,467		1,019	4,278	3,915	99	82	81	79	89
7/24	8	6	57		23	168	67	1,501	2,781	1,524		1,042	4,446	3,982	100	86	83	82	91
7/25	18	11	24		25	145	62	1,519	2,792	1,548		1,067	4,591	4,044	100	87	85	85	92
7/26	11	0	15		20	93	53	1,530	2,792	1,563		1,087	4,684	4,097	100	88	87	87	94
7/27	33		72		14	117	23	1,563		1,635		1,101	4,801	4,120		92	88	89	94
7/28	21		21		11	135	49	1,584		1,656		1,112	4,936	4,169		93	89	91	95
7/29	29		57		18	58	39	1,613		1,713		1,130	4,994	4,208		96	90	92	96
7/30	66		27		12	64	21	1,679		1,740		1,142	5,058	4,229		98	91	93	97
7/31	6		21		10	68	15	1,685		1,761		1,152	5,126	4,244		99	92	95	97
8/01			12		3	38	21			1,773		1,155	5,164	4,265		100	92	95	97
8/02			6		12	30	22			1,779		1,167	5,194	4,287		100	93	96	98
8/03			0		2	34	15			1,779		1,169	5,228	4,302		100	93	97	98
8/04			0		22	30	17			1,779		1,191	5,258	4,319		100	95	97	99
8/05					5	38	5					1,196	5,296	4,324			95	98	99
8/06					11	25	4					1,207	5,321	4,328			96	98	99
8/07					5	16	13					1,212	5,337	4,341			97	99	99
8/08					11	11	3					1,223	5,348	4,344			98	99	99
8/09					5	13	5					1,228	5,361	4,349			98	99	99
8/10					10	8	6					1,238	5,369	4,355			99	99	99
8/11					6	8	6					1,244	5,377	4,361			99	99	100
8/12					6	5	4					1,250	5,382	4,365			100	99	100
8/13					2	2	2					1,252	5,384	4,367			100	99	100
8/14					0	3	0					1,252	5,387	4,367			100	100	100
8/15					0	2	0					1,252	5,389	4,367			100	100	100
8/16					0	1	3					1,252	5,390	4,370			100	100	100
8/17					0	0	1					1,252	5,390	4,371			100	100	100

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Appendix C.2. (Page 2 of 2)

Date	Daily Passage 1995	1996	1997	1998	2000	2001	2002	Cumulative Passage 1995	1996	1997	1998	2000	2001	2002	Percent Passage 1996	1997	2000	2001	2002
8/18					0	7	0					1,252	5,397	4,371			100	100	100
8/19					0	4	0					1,252	5,401	4,371			100	100	100
8/20					1	3 a	1					1,253	5,404 b	4,372			100	100	100
8/21					0	3 b	0					1,253	5,407 b	4,372			100	100	100
8/22					0	3 b	0					1,253	5,410 b	4,372			100	100	100
8/23					0	0	1					1,253	5,410	4,373			100	100	100
8/24					0	1	1					1,253	5,411	4,374			100	100	100
8/25					0	2	2					1,253	5,413	4,376			100	100	100
8/26					0	0	0					1,253	5,413	4,376			100	100	100
8/27					0	0	0					1,253	5,413	4,376			100	100	100
8/28					0	1	0					1,253	5,414	4,376			100	100	100
8/29					1	0	0					1,254	5,414	4,376			100	100	100
8/30					0	0	0					1,254	5,414	4,376			100	100	100
8/31					0	0	1					1,254	5,414	4,377			100	100	100
9/01					0	0	0					1,254	5,414	4,377			100	100	100
9/02					0	0	0					1,254	5,414	4,377			100	100	100
9/03					0	0	0					1,254	5,414	4,377			100	100	100
9/04					0	0	0					1,254	5,414	4,377			100	100	100
9/05					0	0	0					1,254	5,414	4,377			100	100	100
9/06					0	0	0					1,254	5,414	4,377			100	100	100
9/07					0	0	0 e					1,254	5,414	4,377			100	100	100
9/08					0	0	0					1,254	5,414	4,377			100	100	100
9/09					0	0	0					1,254	5,414	4,377			100	100	100
9/10					0	0	0					1,254	5,414	4,377			100	100	100
9/11					0	0	0					1,254	5,414	4,377			100	100	100
9/12					0	0	0					1,254	5,414	4,377			100	100	100
9/13					0	0	0					1,254	5,414	4,377			100	100	100
9/14					0	0	0					1,254	5,414	4,377			100	100	100
9/15					0	0 e	0					1,254	5,414	4,377			100	100	100
9/16					0	0 e	0					1,254		4,377			100	100	100
9/17					0	0 e	0					1,254		4,377			100	100	100
9/18					0	0 e	0					1,254		4,377			100	100	100
9/19					0	0 e	0					1,254		4,377			100	100	100
9/20					0	0 e	0					1,254		4,377			100	100	100

a= estimated salmon passage (partial day)
b= estimated salmon passage (whole day)
c= no estimation for missed longnose sucker counts
d= date outside of target operational period (not included in accumulative totals)
e= no estimates for inoperable period

Appendix C.3. Historic coho and sockeye salmon passage at theTakotna River weir.

Date	Coho Salmon									Sockeye Salmon					
	Daily			Cumulative			% Passage			Daily			Cumulative		
	2000	2001	2002	2000	2001	2002	2000	2001	2002	2000	2001	2002	2000	2001	2002
6/15															
6/16															
6/17															
6/18															
6/19															
6/20															
6/21															
6/22															
6/23		0	0								0	0			
6/24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6/25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6/26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6/27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6/28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6/29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6/30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/15	0	0	0 c	0	0	0	0	0	0	0	0	0 c	0	0	0
7/16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/30	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0
7/31	0	0	1	0	1	2	0	0	0	0	0	0	0	0	0
8/01		0	0	0	1	2	0	0	0	0	0	0	0	0	0
8/02		0	0	0	1	2	0	0	0	0	0	0	0	0	0
8/03		1	0	0	2	2	0	0	0	0	0	0	0	0	0
8/04	3	0	0	3	2	2	0	0	0	0	0	0	0	0	0
8/05	11	0	0	14	2	2	0	0	0	1	0	0	1	0	0
8/06	8	3	2	22	5	4	1	0	0	0	0	0	1	0	0
8/07	14	1	0	36	6	4	1	0	0	0	0	0	1	0	0
8/08	19	1	2	55	7	6	1	0	0	0	0	0	1	0	0
8/09	40	2	6	95	9	12	2	0	0	0	0	0	1	0	0
8/10	31	3	6	126	12	18	3	0	0	0	1	0	1	1	0
8/11	44	12	4	170	24	22	4	1	1	0	0	0	1	1	0
8/12	80	19	26	250	43	48	6	2	1	0	0	0	1	1	0
8/13	42	20	27	292	63	75	7	2	2	0	0	0	1	1	0
8/14	51	29	23	343	92	98	9	4	2	0	0	0	1	1	0
8/15	58	31	36	401	123	134	10	5	3	0	0	0	1	1	0
8/16	54	51	49	455	174	183	11	7	5	0	0	0	1	1	0
8/17	98	44	20	553	218	203	14	8	5	0	0	0	1	1	0

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Appendix C.3. (Page 2 of 2)

Date	Coho Salmon											Sockeye Salmon							
	Daily					Cumulative			% Passage			Daily					Cumulative		
	2000	2001		2002		2000	2001	2002	2000	2001	2002	2000	2001		2002		2000	2001	2002
8/18	146	77		159		699	295	362	18	11	9	0	0		0		1	1	0
8/19	192	66		17		891	361	379	23	14	10	0	0		0		1	1	0
8/20	80	91	a	11		971	452	390	25	17	10	0	0	c	0		1	1	0
8/21	387	91	b	266		1,358	543	656	34	21	16	0	0	c	1		1	1	1
8/22	178	91	b	326		1,536	634	982	39	24	25	0	0	c	0		1	1	1
8/23	241	74		328		1,777	708	1310	45	27	33	0	0		0		1	1	1
8/24	152	145		397		1,929	853	1707	49	33	43	0	0		0		1	1	1
8/25	107	156		301		2,036	1,009	2008	51	39	50	0	0		0		1	1	1
8/26	86	275		267		2,122	1,284	2275	54	49	57	0	0		0		1	1	1
8/27	314	175		107		2,436	1,459	2382	62	56	60	0	0		0		1	1	1
8/28	490	151		134		2,926	1,610	2516	74	62	63	0	0		0		1	1	1
8/29	140	164		121		3,066	1,774	2637	77	68	66	0	0		0		1	1	1
8/30	120	104		127		3,186	1,878	2764	81	72	69	0	0		0		1	1	1
8/31	62	137		205		3,248	2,015	2969	82	77	75	0	0		0		1	1	1
9/01	70	105		133		3,318	2,120	3102	84	81	78	0	0		0		1	1	1
9/02	66	92		107		3,384	2,212	3209	86	85	81	0	0		0		1	1	1
9/03	54	71		63		3,438	2,283	3272	87	88	82	0	0		0		1	1	1
9/04	70	73		90		3,508	2,356	3362	89	90	84	0	0		0		1	1	1
9/05	46	68		118		3,554	2,424	3480	90	93	87	0	0		0		1	1	1
9/06	100	26		134		3,654	2,450	3614	92	94	91	0	0		0		1	1	1
9/07	42	13		109	e	3,696	2,463	3723	93	95	93	0	0		0	e	1	1	1
9/08	25	14		79		3,721	2,477	3802	94	95	95	0	0		0		1	1	1
9/09	30	14		39		3,751	2,491	3841	95	96	96	0	0		0		1	1	1
9/10	36	15		19		3,787	2,506	3860	96	96	97	0	0		0		1	1	1
9/11	40	11		21		3,827	2,517	3881	97	97	97	0	0		0		1	1	1
9/12	27	24		37		3,854	2,541	3918	97	98	98	0	0		0		1	1	1
9/13	29	12		13		3,883	2,553	3931	98	98	99	0	0		0		1	1	1
9/14	16	15		14		3,899	2,568	3945	99	99	99	0	0		0		1	1	1
9/15	9	6	b	16		3,908	2,574	3961	99	99	99	0		e	0		1	1	1
9/16	15	11	b	7		3,923	2,585	3968	99	99	100	0		e	0		1	1	1
9/17	5	3	b	7		3,928	2,588	3975	99	99	100	0		e	0		1	1	1
9/18	8	5	b	2		3,936	2,593	3977	99	100	100	0		e	0		1	1	1
9/19	10	6	b	2		3,946	2,599	3979	100	100	100	0		e	0		1	1	1
9/20	11	7	b	5		3,957	2,606	3984	100	100	100	0		e	0		1	1	1

a= estimated salmon passage (partial day)
b= estimated salmon passage (whole day)
c= no estimation for missed longnose sucker counts
d= date outside of target operational period (not included in accumulative totals)
e= no estimates for inoperable period

Appendix C.4. Historic pink salmon and longnose sucker passage at the Takotna River weir.

Date	Pink Salmon						Longnose Sucker								
	Daily			Cumulative			Daily			Cumulative			Cumulative Percent		
	2000	2001	2002	2000	2001	2002	2000	2001	2002	2000	2001	2002	2000	2001	2002
6/15															
6/16															
6/17															
6/18															
6/19															
6/20															
6/21															
6/22		0	0												
6/23	0	0	0	0	0	0		2,186	0		2,186	0		16	0
6/24	0	0	0	0	0	0	2	571	3	2	2,757	3	0	20	0
6/25	0	0	0	0	0	0	67	2,746	1	69	5,503	4	2	41	1
6/26	0	0	0	0	0	0	82	2,076	7	151	7,579	11	4	56	2
6/27	0	0	0	0	0	0	63	1,748	2	214	9,327	13	6	69	2
6/28	0	0	0	0	0	0	101	113	21	315	9,440	34	8	70	6
6/29	0	0	0	0	0	0	100	1,095	3	415	10,535	37	11	78	6
6/30	0	0	0	0	0	0	220	641	19	635	11,176	56	17	83	9
7/01	0	0	0	0	0	0	406	633	11	1,041	11,809	67	27	88	11
7/02	0	0	0	0	0	0	641	207	0	1,682	12,016	67	44	89	11
7/03	0	0	0	0	0	0	489	94	0	2,171	12,110	67	57	90	11
7/04	0	0	0	0	0	0	264	30	0	2,435	12,140	67	64	90	11
7/05	0	0	0	0	0	0	134	23	8	2,569	12,163	75	68	90	12
7/06	0	0	0	0	0	0	107	5	1	2,676	12,168	76	70	90	13
7/07	0	0	0	0	0	0	158	0	4	2,834	12,168	80	75	90	13
7/08	0	0	0	0	0	0	229	93	5	3,063	12,261	85	81	91	14
7/09	0	0	0	0	0	0	118	38	2	3,181	12,299	87	84	91	14
7/10	0	0	0	0	0	0	112	117	0	3,293	12,416	87	87	92	14
7/11	0	0	0	0	0	0	94	1	96	3,387	12,417	183	89	92	30
7/12	0	0	0	0	0	0	56	20	75	3,443	12,437	258	91	92	43
7/13	0	0	0	0	0	0	112	110	15	3,555	12,547	273	94	93	45
7/14	0	0	0	0	0	0	60	140	1	3,615	12,687	274	95	94	45
7/15	0	0	0 c	0	0	0	63	107	7 c	3,678	12,794	281	97	95	47
7/16	0	0	0	0	0	0	22	58	0	3,700	12,852	281	97	95	47
7/17	0	0	0	0	0	0	9	9	0	3,709	12,861	281	98	96	47
7/18	0	0	0	0	0	0	7	95	2	3,716	12,956	283	98	96	47
7/19	0	0	0	0	0	0	0	203	4	3,716	13,159	287	98	98	48
7/20	0	0	0	0	0	0	3	39	3	3,719	13,198	290	98	98	48
7/21	0	0	0	0	0	0	9	38	1	3,728	13,236	291	98	98	48
7/22	0	0	0	0	0	0	4	9	0	3,732	13,245	291	98	98	48
7/23	0	0	0	0	0	0	0	19	13	3,732	13,264	304	98	99	50
7/24	0	0	0	0	0	0	0	39	0	3,732	13,303	304	98	99	50
7/25	0	0	0	0	0	0	1	19	1	3,733	13,322	305	98	99	50
7/26	0	0	0	0	0	0	4	1	19	3,737	13,323	324	98	99	54
7/27	0	0	0	0	0	0	4	6	0	3,741	13,329	324	98	99	54
7/28	0	0	0	0	0	0	1	1	4	3,742	13,330	328	99	99	54
7/29	0	0	0	0	0	0	7	34	5	3,749	13,364	333	99	99	55
7/30	0	0	1	0	0	1	0	0	98	3,749	13,364	431	99	99	71
7/31	0	0	0	0	0	0	2	7	52	3,751	13,371	483	99	99	80
8/01	0	0	0	0	0	0	2	9	4	3,753	13,380	487	99	99	81
8/02	0	0	0	0	0	0	7	22	5	3,760	13,402	492	99	100	81
8/03	0	0	0	0	0	0	3	0	2	3,763	13,402	494	99	100	82
8/04	0	0	0	0	0	0	1	0	0	3,764	13,402	494	99	100	82
8/05	0	0	0	0	0	0	8	0	0	3,772	13,402	494	99	100	82
8/06	0	0	0	0	0	0	4	0	20	3,776	13,402	514	99	100	85
8/07	0	0	0	0	0	0	3	0	14	3,779	13,402	528	99	100	87
8/08	0	0	0	0	0	0	3	0	0	3,782	13,402	528	100	100	87
8/09	0	0	0	0	0	0	0	0	0	3,782	13,402	528	100	100	87
8/10	0	0	0	0	0	0	1	0	0	3,783	13,402	528	100	100	87
8/11	0	0	0	0	0	0	0	0	0	3,783	13,402	528	100	100	87
8/12	0	0	0	0	0	0	7	0	5	3,790	13,402	533	100	100	88
8/13	0	0	0	0	0	0	0	0	6	3,790	13,402	539	100	100	89
8/14	0	0	0	0	0	0	0	0	5	3,790	13,402	544	100	100	90
8/15	0	0	0	0	0	0	0	0	2	3,790	13,402	546	100	100	90
8/16	0	0	0	0	0	0	0	0	2	3,790	13,402	548	100	100	91
8/17	0	0	0	0	0	0	0	0	6	3,790	13,402	554	100	100	92

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Appendix C.4. (Page 2 of 2)

Date	Pink Salmon						Longnose Sucker								
	Daily			Cumulative			Daily			Cumulative			Cumulative Percent		
	2000	2001	2002	2000	2001	2002	2000	2001	2002	2000	2001	2002	2000	2001	2002
8/18	0	0	0	0	0	0	0	0	1	3,790	13,402	555	100	100	92
8/19	0	0	0	0	0	0	0	0	0	3,790	13,402	555	100	100	92
8/20	0	0	0	0	0	0	0	0 c	0	3,790	13,402	555	100	100	92
8/21	0	0	0	0	0	0	0	0 c	0	3,790	13,402	555	100	100	92
8/22	0	0	0	0	0	0	2	0 c	1	3,792	13,402	556	100	100	92
8/23	0	0	0	0	0	0	4	0	2	3,796	13,402	558	100	100	92
8/24	0	0	0	0	0	0	1	0	12	3,797	13,402	570	100	100	94
8/25	0	0	0	0	0	0	0	0	9	3,797	13,402	579	100	100	96
8/26	0	0	0	0	0	0	1	0	3	3,798	13,402	582	100	100	96
8/27	0	0	0	0	0	0	0	0	7	3,798	13,402	589	100	100	98
8/28	0	0	0	0	0	0	0	0	1	3,798	13,402	590	100	100	98
8/29	0	0	0	0	0	0	0	0	1	3,798	13,402	591	100	100	98
8/30	0	0	0	0	0	0	0	0	1	3,798	13,402	592	100	100	98
8/31	0	0	0	0	0	0	0	0	1	3,798	13,402	593	100	100	98
9/01	0	0	0	0	0	0	0	4	2	3,798	13,406	595	100	100	99
9/02	0	0	0	0	0	0	0	23	0	3,798	13,429	595	100	100	99
9/03	0	0	0	0	0	0	0	16	2	3,798	13,445	597	100	100	99
9/04	0	0	0	0	0	0	0	5	1	3,798	13,450	598	100	100	99
9/05	0	0	0	0	0	0	0	1	1	3,798	13,451	599	100	100	99
9/06	0	0	0	0	0	0	0	1	4	3,798	13,452	603	100	100	100
9/07	0	0	0 e	0	0	0	0	1	1 c	3,798	13,453	604	100	100	100
9/08	0	0	0	0	0	0	0	0	0	3,798	13,453	604	100	100	100
9/09	0	0	0	0	0	0	0	1	0	3,798	13,454	604	100	100	100
9/10	0	0	0	0	0	0	0	1	0	3,798	13,455	604	100	100	100
9/11	0	0	0	0	0	0	0	0	0	3,798	13,455	604	100	100	100
9/12	0	0	0	0	0	0	0	1	0	3,798	13,456	604	100	100	100
9/13	0	0	0	0	0	0	0	0	0	3,798	13,456	604	100	100	100
9/14	0	0	0	0	0	0	0	2	0	3,798	13,458	604	100	100	100
9/15	0	e	0	0	0	0	0	0 c	0	3,798	13,458	604	100	100	100
9/16	0	e	0	0	0	0	0	0 c	0	3,798	13,458	604	100	100	100
9/17	0	e	0	0	0	0	0	0 c	0	3,798	13,458	604	100	100	100
9/18	0	e	0	0	0	0	0	0 c	0	3,798	13,458	604	100	100	100
9/19	0	e	0	0	0	0	0	0 c	0	3,798	13,458	604	100	100	100
9/20	0	e	0	0	0	0	0	0 c	0	3,798	13,458	604	100	100	100

a= estimated salmon passage (partial day)
b= estimated salmon passage (whole day)
c= no estimation for missed longnose sucker counts
d= date outside of target operational period (not included in accumulative totals)
e= no estimates for inoperable period

Appendix C.5. Comparing historical longnose sucker passage for selected weir projects.

Date	George River			Tatlawiksuk River			Takotna River		
	2000	2001	2002	2000	2001	2002	2000	2001	2002
15-Jun				3					
16-Jun				1					
17-Jun	45			122		84			
18-Jun	348			35		59			
19-Jun	34			36		41			
20-Jun	73			3	302	9			
21-Jun	238		25	12	253	49			
22-Jun	343		344	159	164	122			
23-Jun	927		700	154	392	194		2,186	0
24-Jun	686		44	198	439	21	2	571	3
25-Jun	1,204	29	132	51	194	32	67	2,746	1
26-Jun	130	819	118	55	116	3	82	2,076	7
27-Jun	262	1,439	90	12	63	3	63	1,748	2
28-Jun	6	2,105	236	18	17	2	101	113	21
29-Jun	8	5,831	10	0	25	20	100	1,095	3
30-Jun	0	369	88	0	76	0	220	641	19
1-Jul	8	88	150	5	64	17	406	633	11
2-Jul	9	905	3	19	21	48	641	207	0
3-Jul	395	5	24	116	24	24	489	94	0
4-Jul	324	14	2	36	7	51	264	30	0
5-Jul	965	32	16	0	3	43	134	23	8
6-Jul	24	8	189	1	4	84	107	5	1
7-Jul	400	241	432	0	7	36	155	0	4
8-Jul	12	200	449	0	4	21	229	93	5
9-Jul	107	842	87	2	30	21	118	38	2
10-Jul	13	168	358	0	12	49	112	117	0
11-Jul	261	494	353	1	4	12	94		96
12-Jul	576	331	333	9	26	3	56	20	75
13-Jul	184	164	232	4	101	4	112	110	15
14-Jul	0	219	46	0	49	1	60	140	1
15-Jul	66	38	98	0	49	4	63	107	7
16-Jul	1	57	409	0	3	18	22	58	0
17-Jul	0	4	265	0	7	27	9	9	0
18-Jul	0	129	236	0	41	1	7	95	2
19-Jul	2	92	132	0	15	0	0	203	4
20-Jul	1	148	3	0	27	2	3	39	3
21-Jul	2	178	27	0	23	3	9	38	1
22-Jul	2	81	14	0	30	0	4	9	0
23-Jul	4	66	46	0	33	1	0	19	13
24-Jul	1	79	41	0	21	1	0	39	0
25-Jul	7	30	11	0	11	1	1	19	1
26-Jul	6	19	8	0	1	1	4	1	19
27-Jul	4	33	4	0	2	0	4	6	0
28-Jul	0	32	5	0	4	0	1	1	4
29-Jul	0	54	18	0	1	0	7	34	5
30-Jul	0	8	18	0	2	1	0	0	98
31-Jul	1	8	64	0	4	2	2	7	52
1-Aug	0	72	50	0	3	3	2	9	4
2-Aug	1	20	9	0	4	6	7	22	5
3-Aug	2	6	107	0	5	0	3	0	2
4-Aug	1	0	20	0	8	0	1	0	0
5-Aug	1	8	19	0	3	0	8	0	0
6-Aug	0	11	14	0	1	0	4	0	20

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Appendix C.5. (Page 2 of 2)

Date	George River			Tatlawiksuk River			Takotna River		
	2000	2001	2002	2000	2001	2002	2000	2001	2002
7-Aug	0	12	15	0	1	0	3	0	14
8-Aug	0	147	4	0	2	0	3	0	0
9-Aug	0	13	2	0	2	0	0	0	0
10-Aug	0	1	3	0	1	0	1	0	0
11-Aug	0	9	6	0	0	0	0	0	0
12-Aug	0	4	2	0	1	2	7	0	5
13-Aug	3	62	3	0	5	0	0	0	6
14-Aug	0	3	15	0	2	0	0	0	5
15-Aug	0	19	6		25	0	0	0	2
16-Aug	0	39	7		25	0	0	0	2
17-Aug	0	5	10		23	0	0	0	6
18-Aug	0	12	11		21	0	0	0	1
19-Aug	0	7	2		19	0	0	0	0
20-Aug	0	6	5		17	0	0	0	1
21-Aug	0	5	2		15	0	0	0	1
22-Aug	0	4	5		13	10	2	0	1
23-Aug	0	4	12		11	3	4	0	2
24-Aug	0	3	14		9	1	1	0	12
25-Aug	0	2	26		7	0	0	0	13
26-Aug	1	1	9		5	1	1	0	3
27-Aug	0	0	23		3	1	0	0	7
28-Aug	0	1	19		0	3	0	0	1
29-Aug	0	0	6		1	1	0	0	1
30-Aug	0	0	3		0	0	0	0	1
31-Aug	0	3	7		0	0	0	0	1
1-Sep	0	1	6		1	0	0	4	2
2-Sep	0	1	4		0	0	0	23	0
3-Sep	0	0	5		0	0	0	16	2
4-Sep	0	0	16		0	0	0	5	1
5-Sep	0	0	1		0	2	0	1	1
6-Sep	0	0	6		0	1	0	1	4
7-Sep	0	0	2		0	1	0	1	1
8-Sep	0	0	2		0	0	0	0	0
9-Sep	0	0	4		0	0	0	1	0
10-Sep	0	0	2		0	0	0	1	0
11-Sep	0	0	3		2	0	0	0	0
12-Sep	0	0	10		0	0	0	1	0
13-Sep	0	0	2		0	0	0	0	0
14-Sep	0	0	0		0	0	0	2	0
15-Sep	0	0	1		2	0	0	0	0
16-Sep	0	0	5			0	0	0	0
17-Sep		0	6			0	0	0	0
18-Sep		0	3			0	0	0	0
19-Sep		0	0			0	0	0	0
20-Sep		0	0			0	0	0	0
Totals	7,688	17,841	8,376	8,376	4,906	3,157	3,798	15,458	610

APPENDIX D

LENGTH DATA FOR JUVENILE SALMON SAMPLED IN THE TAKOTNA RIVER DRAINAGE, 2002

Appendix D.1. Trap caught juvenile chinook salmon lengths by month and number caught, 2002.

Lengths (mm)	July	August	September	October	December
	Lower Big and Fourth-of-July Creeks	Takotna River	4th July and Above	Lower Big and Fourth-of-July Creeks	Big Creek
	Number Caught	Number Caught	Number Caught	Number Caught	Number Caught
48	0	1	0	0	0
49	0	0	0	0	0
50	0	0	0	0	0
51	0	0	0	0	1
52	0	0	0	0	0
53	0	0	0	0	0
54	0	0	0	0	0
55	0	0	0	0	0
56	0	0	0	0	0
57	1	0	0	0	0
58	3	0	1	0	0
59	3	0	0	0	0
60	3	0	0	0	0
61	1	0	0	0	1
62	1	0	0	0	0
63	0	0	0	0	0
64	2	0	1	0	1
65	1	0	0	1	0
66	1	0	0	0	0
67	2	0	0	0	0
68	6	0	0	1	0
69	1	0	1	0	0
70	1	0	1	0	0
71	1	0	0	1	0
72	6	0	0	3	0
73	4	0	0	5	1
74	1	0	0	1	1
75	9	0	0	5	1
76	2	0	0	6	1
77	6	0	0	3	0
78	4	0	0	3	2
79	5	0	0	2	0
80	5	0	0	3	0
81	1	0	0	3	0
82	1	0	0	3	1
83	3	0	0	2	0
84	0	0	0	2	0
85	0	0	0	1	0
86	0	0	0	4	0
87	0	1	0	4	0
88	0	0	0	6	0
89	0	0	0	1	0
90	0	0	0	1	0
91	0	0	0	0	0
92	0	0	0	3	0
93	0	0	0	4	1
94	1	0	0	0	0
95	0	0	0	0	0
96	0	0	0	1	0
97	0	0	0	1	0
98	0	1	0	0	0
99	0	0	0	1	0
100	0	0	0	0	0
101	0	1	0	3	0
102	1	0	0	0	0
Totals	76	4	4	74	11

Appendix D.2. Trap caught juvenile coho salmon lengths by season and number caught, 2002.

Length (mm)	Spring (March and April)	Summer (June-September)	Fall (October-December)
	Lower Big Creek	Lower Big Creek, Fourth-of-July Creek and the Takotna River	Lower Big Creek and Fourth-of-July Creek
	Number Caught	Number Caught	Number Caught
46	0	1	0
47	0	0	0
48	0	0	0
49	0	0	0
50	0	0	0
51	0	2	0
52	0	1	0
53	0	0	0
54	0	2	0
55	0	2	0
56	0	1	1
57	0	2	1
58	0	2	0
59	0	2	0
60	0	2	0
61	0	0	1
62	0	2	2
63	0	2	0
64	1	0	1
65	1	0	0
66	0	0	2
67	0	2	1
68	0	3	3
69	0	0	0
70	0	0	3
71	0	0	0
72	0	2	0
73	0	3	0
74	0	3	1
75	0	4	2
76	0	6	2
77	0	3	0
78	0	7	1
79	0	3	0
80	0	5	1
81	0	3	2
82	0	2	0
83	0	4	1
84	0	6	0
85	0	0	1
86	0	4	0
87	0	3	1
88	0	1	0
89	0	3	1
90	1	1	3
91	0	2	1

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Length (mm)	Spring (March and April)	Summer (June-September)	Fall (October-December)
	Lower Big Creek	Lower Big Creek, Fourth-of-July Creek and the Takotna River	Lower Big Creek and Fourth-of-July Creek
	Number Caught	Number Caught	Number Caught
92	0	1	1
93	1	1	1
94	0	0	1
95	1	2	1
96	0	2	0
97	0	2	4
98	1	1	3
99	0	1	2
100	0	0	3
101	0	2	0
102	1	0	2
103	0	0	2
104	0	0	1
105	0	0	1
106	0	0	1
107	0	1	1
108	3	1	0
109	0	0	0
110	0	1	0
111	1	0	0
112	0	0	0
113	1	1	0
114	0	0	1
115	0	0	0
116	1	0	0
117	0	0	0
118	0	0	0
119	0	2	0
120	0	0	0
121	0	0	0
122	0	0	0
123	0	0	0
124	0	0	1
125	0	0	0
126	0	0	0
127	0	0	0
128	0	0	1
Totals	13	109	59

APPENDIX E
HISTORIC ASL DATA FOR FISH SAMPLED AT THE TAKOTNA RIVER WEIR

Appendix E.1. Historical sex and age data for trap caught chinook salmon at the Takotna River weir.

Year	Sample Dates (Stratum Dates)	Sample Size	Sex	Age Class 1.1 (Age 3) Esc.	%	1.2 (Age 4) Esc.	%	2.2 (Age 5) Esc.	%	1.3 (Age 5) Esc.	%	1.4 (Age 6) Esc.	%	1.5 (Age 7) Esc.	%	Total Esc.	%
2000	7/5- 7/7 (6/25-7/9)	25	M	5	4.0	38	32.0	0	0.0	38	32.0	15	12.0	0	0.0	96	80.0
			F	0	0.0	0	0.0	0	0.0	5	4.0	19	16.0	0	0.0	24	20.0
			Subtotal	5	4.0	38	32.0	0	0.0	43	36.0	34	28.0	0	0.0	120	100.0
	7/12- 7/14 (7/10- 7/16)	23	M	0	0.0	8	17.4	0	0.0	18	39.1	12	26.1	2	4.3	39	87.0
			F	0	0.0	0	0.0	0	0.0	0	0.0	6	13.0	0	0.0	6	13.0
			Subtotal	0	0.0	8	17.4	0	0.0	18	39.1	18	39.1	2	4.3	45	100.0
	7/19- 7/21 (7/17- 7/25)	16	M	0	0.0	28	31.3	0	0.0	23	25.0	17	18.8	0	0.0	68	75.0
			F	0	0.0	0	0.0	0	0.0	0	0.0	22	25.0	0	0.0	22	25.0
			Subtotal	0	0.0	28	31.3	0	0.0	23	25.0	39	43.8	0	0.0	90	100.0
	7/28-7/30, 8/14, 8/27 (7/26-9/9)	14	M	0	0.0	32	35.7	0	0.0	19	21.4	6	7.1	0	0.0	58	64.3
			F	0	0.0	0	0.0	0	0.0	7	7.2	26	28.6	0	0.0	32	35.7
			Subtotal	0	0.0	32	35.7	0	0.0	26	28.6	32	35.7	0	0.0	90	100.0
	Season	78	M	5	1.4	106	30.9	0	0.0	98	28.3	50	14.3	2	0.6	260	75.5
			F	0	0.0	0	0.0	0	0.0	11	3.3	73	21.3	0	0.0	85	24.5
			Total	5	1.4	106	30.9	0	0.0	109	31.6	123	35.6	2	0.6	345	100.0
2001[a]	7/1 - 7/6, 7/10 - 7/13	45	M		0.0		6.7		0.0		26.7		33.3		0.0		66.7
			F		0.0		0.0		0.0		4.4		28.9		0.0		33.3
			Subtotal		0.0		6.7		0.0				62.2		0.0		100.0
	7/17 - 7/18 7/21 - 7/23 7/28 - 7/30 8/5 - 8/7	41	M		0.0		14.6		0.0		14.6		19.5		4.9		53.7
			F		0.0		0.0		0.0		4.9		41.5		0.0		46.3
			Subtotal		0.0		14.6		0.0		19.5		61.0		4.9		100.0
	Season	86	M		0.0		10.5		0.0		20.9		26.7		2.3		60.5
			F		0.0		0.0		0.0		4.7		34.9		0.0		39.5
			Total		0.0		10.5		0.0		25.6		61.6		2.3		100.0
2002	6/27 - 7/1 (6/23 - 7/2)	12	M	0	0	7	41.7	0	0	5	33.3	2	8.4	0	0	13	83.3
			F	0	0	1	8.3	0	0	0	0	1	8.3	0	0	3	16.7
			Subtotal	0	0	8	50	0	0	5	33.3	3	16.7	0	0	16	100.0
	7/4 - 7/11 (7/3 - 13)	43	M	0	0	51	23.3	5	2.3	62	27.9	46	20.9	0	0	164	74.4
			F	0	0	0	0	0	0	0	0	57	25.6	0	0	57	25.6
			Subtotal	0	0	51	23.3	5	2.3	62	27.9	103	46.5	0	0	221	100.0
	7/15 - 7/22 (7/14 - 23)	26	M	0	0	0	0	0	0	11	34.6	7	23.1	0	0	18	57.7
			F	0	0	1	3.8	0	0	3	7.7	10	30.7	0	0	14	42.3
			Subtotal	0	0	1	3.8	0	0	14	42.3	17	53.8	0	0	32	100.0
	7/25, 7/26, 7/29 - 7/30, 8/6 (7/24 - 9/19)	17	M	0	0	8	17.6	0	0	11	23.5	5	11.8	0	0	25	52.9
			F	0	0	0	0	0	0	3	5.9	17	35.3	3	5.9	22	47.1
			Subtotal	0	0	8	17.6	0	0	14	29.4	22	47.1	3	5.9	47	100.0
	Season	98	M	0	0	66	21	5	1.6	89	28.2	61	19.1	0	0	221	70.0
			F	0	0	3	0.8	0	0	5	1.7	84	26.7	3	0.9	95	30.0
			Total	0	0	69	21.8	5	1.6	94	29.9	145	45.8	3	0.9	316	100.0

a = Samples taken for chinook salmon not applied to total escapement.

Appendix E.2. Historical age and length data for trap caught chinook salmon at the Takotna River weir.

Year	Sample Date (Stratum Date)	Sex		Age Class 1.1 (Age 3)	1.2 (Age 4)	2.2 (Age 5)	1.3 (Age 5)	1.4 (Age 6)	1.5 (Age 7)
2000	7/5-7/7	M	Mean Length	451	515	674	743		
	(6/25-7/9)		Std. Error	-	23	19	8		
			Range	451- 451	418- 623	582- 754	728- 752		
			Sample Size	1	8	8	3	0	0
		F	Mean Length			722	844		
			Std. Error			-	16		
			Range			722- 722	805- 883		
			Sample Size	0	0	1	4	0	0
	7/12-7/14	M	Mean Length		519	646	802	895	
	(7/10-7/16)		Std. Error		22	16	28	-	
			Range		476- 575	557- 706	728- 911	895- 895	
			Sample Size	0	4	9	6	1	0
		F	Mean Length				873		
			Std. Error				50		
			Range				780- 950		
			Sample Size	0	0	0	3	0	0
	7/19-7/21	M	Mean Length		482	650	760		
	(7/17-7/25)		Std. Error		14	28	62		
			Range		453- 529	595- 719	673- 880		
			Sample Size	0	5	4	3	0	0
		F	Mean Length				781		
			Std. Error				37		
			Range				697- 860		
			Sample Size	0	0	0	4	0	0
	7/28-7/30, 8/14, 8/27	M	Mean Length		498	710	798		
	(7/26-9/9)		Std. Error		27	23	-		
			Range		430- 585	685- 755	798- 798		
			Sample Size	0	5	3	1	0	0
		F	Mean Length			812	821		
			Std. Error				39		
			Range			812- 812	714- 898		
			Sample Size	0	0	1	4	0	0
	Season	M	Mean Length	451	501	671	770	895	
			Range	451- 451	418- 623	557- 755	673- 911	895- 895	
			Sample Size	1	22	24	13	1	0
		F	Mean Length			774	818		
			Range			722- 812	697- 950		
			Sample Size	0	0	2	15	0	0

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Appendix E.2. (Page 2 of 3)

Year	Sample Date (Stratum Date)	Sex		Age Class 1.1 (Age 3)	1.2 (Age 4)	2.2 (Age 5)	1.3 (Age 5)	1.4 (Age 6)	1.5 (Age 7)
2001[a]	7/5 - 7/6	M	Mean Length		552	663	810		
	7/10 - 7/13		Std. Error		6	14	15		
			Range		540-560	595-735	710-895		
			Sample Size	0	3	12	15	0	0
		F	Mean Length			783	867		
			Std. Error			78	8		
			Range			705-860	810-910		
			Sample Size	0	0	2	13	0	0
	7/17 - 7/18	M	Mean Length		498	688	828	855	
	7/21 - 7/23		Std. Error		25	33	29	5	
	7/28 - 7/30		Range		400-555	590-825	640-895	850-860	
	8/5 - 8/7		Sample Size	0	6	6	8	2	0
		F	Mean Length			770	861		
			Std. Error			30	15		
			Range			740-800	780-985		
			Sample Size	0	0	2	17	0	0
	Season	M	Mean Length		516	671	816	855	
			Range		400-560	590-825	640-895	850-860	
			Sample Size	0	9	18	23	2	0
		F	Mean Length			776	864		
			Range			705-860	780-795		
			Sample Size	0	0	4	30	0	0
2002	6/27- 7/1	M	Mean Length		544		679	765	
	(6/23 - 7/2)		Std. Error		12		12	-	
			Range		500- 565		645- 695	765- 765	
			Sample Size	0	5	0	4	1	0
		F	Mean Length		575			865	
			Std. Error		-			-	
			Range		575- 575			865- 865	
			Sample Size	0	1	0	0	1	0
	7/4-7/11	M	Mean Length		553	560	679	756	
	(7/3 - 13)		Std. Error		6	-	12	25	
			Range		520- 580	560- 560	595- 742	645- 850	
			Sample Size	0	10	1	12	9	0
		F	Mean Length					876	
			Std. Error					13	
			Range					800- 960	
			Sample Size	0	0	0	0	11	0

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Appendix E.2. (Page 3 of 3)

Year	Sample Date (Stratum Date)	Sex		Age Class 1.1 (Age 3)	1.2 (Age 4)	2.2 (Age 5)	1.3 (Age 5)	1.4 (Age 6)	1.5 (Age 7)
2002	7/15 - 7/22	M	Mean Length				686	763	
(cont.)	(7/14 - 23)		Std. Error				14	38	
			Range				620- 745	612- 875	
			Sample Size	0	0	0	9	6	0
		F	Mean Length		627		814	835	
			Std. Error		-		20	20	
			Range		627- 627		794- 833	740- 922	
			Sample Size	0	1	0	2	8	0
	7/25, 7/26, 7/29	M	Mean Length		568		678	839	
	7/30, 8/6		Std. Error		22		14	19	
	(7/24 - 9/19)		Range		543- 612		648- 710	820- 858	
			Sample Size	0	3	0	4	2	0
		F	Mean Length				825	855	827
			Std. Error				-	36	-
			Range				825- 825	755- 976	827- 827
			Sample Size	0	0	0	1	6	1
	Season	M	Mean Length		554	560	679	765	
			Range		500- 612	560- 560	595- 745	612- 875	
			Sample Size	0	18	1	29	18	0
		F	Mean Length		600		820	867	827
			Range		575- 627		794- 833	740- 976	827- 827
			Sample Size	0	2	0	3	26	1

a = Samples not applied to escapement.

Appendix E.3. Historical sex and age data for trap caught chum salmon at the Takotna River weir.

Year	Sample Dates (Stratum Dates)	Sample Size	Sex	Age Class 0.2 (Age 3) Esc.	%	0.3 (Age 4) Esc.	%	0.4 (Age 5) Esc.	%	0.5 (Age 6) Esc.	%	Total Esc.	%
2000	7/5 - 7/7 (6/24 - 7/9)	85	M	0	0	73	17.6	117	28.2	5	1.2	195	47.1
			F	0	0	132	31.8	88	21.2	0	0	220	52.9
			Subtotal	0	0	205	49.4	205	49.4	5	1.2	415	100.0
	7/12 - 7/14 (7/10 - 7/16)	117	M	0	0	58	20.5	41	14.6	0	0	98	35.0
			F	0	0	120	42.7	62	22.2	0	0	183	65.0
			Subtotal	0	0	178	63.2	103	36.8	0	0	281	100.0
	7/19 - 7/21 (7/17 - 7/24)	140	M	8	2.2	104	30	52	15	0	0	163	47.1
			F	7	2.1	131	37.9	44	12.9	0	0	183	52.9
			Subtotal	15	4.3	235	67.9	96	27.9	0	0	346	100.0
	7/26 - 7/29 (7/25 - 8/29)	23	M	0	0	55	26.1	19	8.7	0	0	74	34.8
			F	18	8.7	102	47.8	18	8.7	0	0	138	65.2
			Subtotal	18	8.7	157	73.9	37	17.4	0	0	212	100.0
	Season	365	M	7	0.6	290	23.1	229	18.2	5	0.4	531	42.3
			F	26	2.1	484	38.6	213	17	0	0	723	57.7
			Total	33	2.7	774	61.7	442	35.2	5	0.4	1254	100.0
2001	7/5 - 7/6 (6/20 - 7/8)	74	M	0	0	223	36.5	190	31.1	0	0	413	67.6
			F	0	0	74	12.1	124	20.3	0	0	198	32.4
			Subtotal	0	0	297	48.6	314	51.4	0		611	100.0
	7/10 - 7/14 (7/9 - 7/15)	153	M	0	0	567	33.3	289	17	11	0.7	867	51.0
			F	0	0	589	34.7	245	14.4	0	0	834	49.0
			Subtotal	0	0	1156	68	534	31.4	11	0.7	1701	100.0
	7/17 - 7/18 (7/16 - 7/19)	83	M	0	0	429	39.7	130	12.1	0	0	559	51.8
			F	0	0	468	43.4	52	4.8	0	0	520	48.2
			Subtotal	0	0	897	83.1	182	16.9	0	0	1079	100.0
	7/21 - 7/23 (7/20 - 7/25)	103	M	0	0	421	34.9	141	11.7	0	0	562	46.6
			F	0	0	527	43.7	117	9.7	0	0	644	53.4
			Subtotal	0	0	948	78.6	258	21.4	0	0	1206	100.0
	7/28 - 7/30 (7/26 - 8/2)	106	M	0	0	222	36.8	12	1.9	0	0	233	38.7
			F	0	0	335	55.7	34	5.6	0	0	370	61.3
			Subtotal	0	0	557	92.5	46	7.5	0	0	603	100.0
	8/5 - 8/7 (8/3 - 8/28)	54	M	0	0	57	25.9	4	1.9	0	0	61	27.8
			F	4	0.9	155	70.4	0	0	0	0	159	72.2
			Subtotal	4	0.9	212	96.3	4	1.9	0	0	220	100.0
	Season	573	M	0	0	1919	35.4	765	14.1	11	0.2	2695	49.7
			F	4	0.1	2149	39.7	572	10.6	0	0	2725	50.3
			Total	4	0.1	4068	75.1	1337	24.7	11	0.2	5420	100.0
2002	6/27, 6/28 (6/23-6/29)	190	M	0	0.0	59	11.1	188	35.2	6	1.1	253	47.4
			F	0	0.0	76	14.2	200	37.4	5	1.0	281	52.6
			Subtotal	0	0.0	135	25.3	388	72.6	11	2.1	534	100.0
	7/1, 7/2, 7/3 (6/30-7/5)	137	M	0	0.0	207	23.4	311	35	7	0.7	525	59.1
			F	0	0.0	156	17.5	188	21.2	19	2.2	363	40.9
			Subtotal	0	0.0	363	40.9	499	56.2	26	2.9	888	100.0
	7/8, 7/9, 7/10 (7/6-7/12)	164	M	9	0.6	277	19.5	476	33.5	9	0.6	770	54.3
			F	8	0.6	311	22.0	329	23.2	0	0.0	649	45.7
			Subtotal	17	1.2	588	41.5	805	56.7	9	0.6	1419	100.0
	7/15, 7/16, 7/17 (7/13-7/19	131	M	6	0.8	208	29.0	115	16	0	0.0	329	45.8
			F	5	0.7	187	26.0	198	27.5	0	0.0	390	54.2
			Subtotal	11	1.5	395	55.0	313	43.5	0	0.0	719	100.0
	7/22, 7/23, 7/24 (7/20-7/26	141	M	15	2.8	213	39.7	84	15.6	4	0.7	316	58.9
			F	23	4.3	153	28.4	45	8.5	0	0.0	221	41.1
			Subtotal	38	7.1	366	68.1	129	24.1	4	0.7	537	100.0
	7/29-8/7 (7/27-9/20)	61	M	27	9.9	74	26.3	23	8.2	0	0.0	124	44.3
			F	14	4.9	73	26.2	64	22.9	5	1.6	156	55.7
			Subtotal	41	14.8	147	52.5	87	31.1	5	1.6	280	100.0
	Season	824	M	57	1.3	1039	23.7	1197	27.4	24	0.5	2317	52.9
			F	51	1.2	955	21.8	1024	23.4	30	0.7	2064	47.1
			Total	108	2.5	1994	45.5	2221	50.8	54	1.2	4377	100.0

Appendix E.4. Historical age and length data for trap caught chum salmon at the Takotna River weir.

Year	Sample Date (Stratum Dates)	Sex		Age Class 0.2 (Age 3)	0.3 (Age 4)	0.4 (Age 5)	0.5 (Age 6)
2000	7/5 - 7/7	M	Mean Length		554	606	648
	(6/24 - 7/9)		Std. Error		6	7	-
			Range		507-580	540-658	648
			Sample Size	0	15	24	1
		F	Mean Length		542	576	
			Std. Error		4	9	
			Range		490-583	514-667	
			Sample Size	0	27	18	0
	7/12 - 7/14	M	Mean Length		561	577	
	(7/10 - 7/16)		Std. Error		3	4	
			Range		537-587	548-602	
			Sample Size	0	24	17	0
		F	Mean Length		540	558	
			Std. Error		3	6	
			Range		500-583	485-614	
			Sample Size	0	50	26	0
	7/19 - 7/20	M	Mean Length	547	562	590	
	(7/17 - 7/24)		Std. Error	29	4	8	
			Range	496-596	502-610	530-698	
			Sample Size	3	42	21	0
		F	Mean Length	546	542	551	
			Std. Error	23	3	7	
			Range	516-591	407-591	515-618	
			Sample Size	3	53	18	0
	7/28 - 7/29	M	Mean Length		564	620	
	(7/25 - 8/29)		Std. Error		6		
			Range		548-588	620	
			Sample Size	0	6	2	0
		F	Mean Length	525	542	519	
			Std. Error	15	10	5	
			Range	510-540	485-587	514-523	
			Sample Size	2	11	2	0
	Season	M	Mean Length	547	560	598	648
			Std. Error	29	2	4	
			Range	496-596	502-610	530-698	648
			Sample Size	3	87	64	1
		F	Mean Length	531	542	560	
			Std. Error	13	3	4	
			Range	510-591	477-591	485-667	
			Sample Size	5	141	64	0

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Appendix E.4. (Page 2 of 4)

Year	Sample Date (Stratum Dates)	Sex		Age Class 0.2 (Age 3)	0.3 (Age 4)	0.4 (Age 5)	0.5 (Age 6)
2001	7/05 - 7/06	M	Mean Length		603	587	
	(6/23 - 7/8)		Std. Error		6	7	
			Range		540- 645	505- 640	
			Sample Size	0	27	23	0
		F	Mean Length		572	563	
			Std. Error		4	7	
			Range		545- 585	500- 600	
			Sample Size	0	9	15	0
	7/10 - 7/14	M	Mean Length		585	591	540
	(7/9 - 7/15)		Std. Error		4	7	-
			Range		535- 650	500- 645	540- 540
			Sample Size	0	51	26	1
		F	Mean Length		551	565	
			Std. Error		3	5	
			Range		495- 600	530- 615	
			Sample Size	0	53	22	0
	7/17 - 7/18	M	Mean Length		578	600	
	(7/16 - 7/19)		Std. Error		4	5	
			Range		540- 620	570- 620	
			Sample Size	0	33	10	0
		F	Mean Length		549	569	
			Std. Error		4	12	
			Range		515- 590	540- 590	
			Sample Size	0	36	4	0
	7/21 - 7/23	M	Mean Length		574	584	
	(7/20 - 7/25)		Std. Error		5	7	
			Range		520- 665	540- 625	
			Sample Size	0	36	12	0
		F	Mean Length		546	576	
			Std. Error		4	7	
			Range		475- 600	540- 615	
			Sample Size	0	45	10	0
	7/28 - 7/30	M	Mean Length		578	585	
	(7/26 - 8/2)		Std. Error		5	10	
			Range		510- 630	575- 595	
			Sample Size	0	39	2	0
		F	Mean Length		552	543	
			Std. Error		3	8	
			Range		500- 600	510- 565	
			Sample Size	0	59	6	0

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Appendix E.4. (Page 3 of 4)

Year	Sample Date (Stratum Dates)	Sex		Age Class 0.2 (Age 3)	0.3 (Age 4)	0.4 (Age 5)	0.5 (Age 6)
2001 (cont.)	8/5 - 8/7 (8/3 - 8/28)	M	Mean Length		559	620	
			Std. Error		10	-	
			Range		490- 610	620- 620	
			Sample Size	0	14	1	0
		F	Mean Length	500	519		
			Std. Error	-	4		
			Range	500- 500	465- 610		
			Sample Size	1	38	0	0
	Season	M	Mean Length		581	590	540
			Range		490- 665	500- 645	540- 540
			Sample Size	0	200	74	1
		F	Mean Length	500	548	566	
			Range	500- 500	465- 610	500- 615	
			Sample Size	1	240	57	0
2002	6/27, 6/28 (6/23-6/29)	M	Mean Length		590	609	613
			Std Error		5	3	8
			Range		544-624	550-660	605-620
			Sample Size	0	21	67	2
		F	Mean Length		574	582	583
			Std Error		4	3	28
			Range		537-625	526-630	555-610
			Sample Size	0	27	71	2
	7/1, 7/2, 7/3 (6/30-7/05	M	Mean Length		590	610	572
			Std Error		7	4	-
			Range		520-696	543-680	572-572
			Sample Size	0	32	48	1
		F	Mean Length		555	576	555
			Std Error		5	4	3
			Range		500-583	530-611	551-562
			Sample Size	0	24	29	3
	7/8, 7/9, 7/10 (7/6-7/12)	M	Mean Length	556	579	605	612
			Std Error	-	5	4	-
			Range	556-556	525-633	525-690	612-612
			Sample Size	1	32	55	1
		F	Mean Length	496	556	571	
			Std Error	-	4	4	
			Range	496-496	498-615	519-625	
			Sample Size	1	36	38	0

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Appendix E.4. (Page 4 of 4)

Year	Sample Date (Stratum Dates)	Sex		Age Class 0.2 (Age 3)	0.3 (Age 4)	0.4 (Age 5)	0.5 (Age 6)
2002 (cont.)	7/15, 7/16, 7/17 (7/13-7/19)	M	Mean Length	515	589	605	
			Std Error	-	5	7	
			Range	515-515	538-648	550-655	
			Sample Size	1	38	21	0
		F	Mean Length	532	542	573	
			Std Error	-	4	5	
			Range	532-532	508-586	515-643	
			Sample Size	1	34	36	0
	7/22, 7/23, 7/24 (7/20-7/26)	M	Mean Length	563	578	591	610
			Std Error	22	4	7	-
			Range	506-605	493-660	550-672	610-610
			Sample Size	4	56	22	1
		F	Mean Length	528	551	561	
			Std Error	8	4	7	
			Range	498-552	476-611	528-600	
			Sample Size	6	40	12	0
	7/29-8/07 (7/27-9/20)	M	Mean Length	538	578	605	
			Std Error	11	6	20	
			Range	510-586	515-611	550-650	
			Sample Size	6	16	5	0
		F	Mean Length	503	536	552	587
			Std Error	12	7	5	-
			Range	482-522	485-574	518-603	587-587
			Sample Size	3	16	14	1
	Season	M	Mean Length	545	583	606	601
			Range	506-605	493-696	525-690	572-620
			Sample Size	12	195	218	5
		F	Mean Length	516	552	573	565
			Range	482-552	476-625	515-643	551-610
			Sample Size	11	177	200	6

Appendix E.5. Historical sex and age data for trap caught coho salmon at the Takotna River weir.

Year	Sample Dates (Stratum Dates)	Sample Size	Sex	Age Class 1.1 (Age 3) Esc.	1.1 (Age 3) %	2.1 (Age 4) Esc.	2.1 (Age 4) %	3.1 (Age 5) Esc.	3.1 (Age 5) %	Total Esc.	Total %
2000	8/14	36	M	0	0.0	421	47.2	25	2.8	446	50.0
	(8/4 - 8/19)		F	0	0.0	445	50.0	0	0.0	445	50.0
			Subtotal	0	0.0	866	97.2	25	2.8	891	100.0
	8/25 - 8/27	152	M	0	0.0	1059	48.7	15	0.7	1073	49.3
	(8/20 - 8/29)		F	0	0.0	1087	50.0	14	0.6	1102	50.7
			Subtotal	0	0.0	2146	98.7	29	1.3	2175	100.0
	9/1 - 9/3	136	M	0	0.0	273	43.4	0	0.0	273	43.4
	(8/30 - 9/7)		F	0	0.0	334	52.9	23	3.7	357	56.6
			Subtotal	0	0.0	607	96.3	23	3.7	630	100.0
	9/11 - 9/13	71	M	4	1.4	106	40.9	0	0.0	110	42.3
	(9/8 - 9/20)		F	7	2.8	140	53.5	4	1.4	151	57.7
			Subtotal	11	4.2	246	94.4	4	1.4	261	100.0
	Season	395	M	4	0.1	1860	47.0	39	1.0	1902	48.1
			F	7	0.2	2006	50.7	41	1.0	2055	51.9
			Total	11	0.3	3866	97.7	80	2.0	3957	100.0
2001	8/19, 8/20, 8/24	142	M	7	0.7	589	58.4	107	10.6	703	69.7
	(7/30 - 8/25)		F	0	0.0	277	27.5	28	2.8	305	30.3
			Subtotal	7	0.7	866	85.9	135	13.4	1008	100.0
	8/28 - 8/29	117	M	0	0.0	522	47.0	38	3.4	560	50.4
	(8/26 - 9/1)		F	0	0.0	494	44.5	57	5.1	551	49.6
			Subtotal	0	0.0	1016	91.5	95	8.5	1111	100.0
	9/5 - 9/6	44	M	0	0.0	199	40.9	66	13.6	265	54.5
	(9/2 - 9/20)		F	0	0.0	210	43.2	11	2.3	221	45.5
			Subtotal	0	0.0	409	84.1	77	15.9	486	100.0
	Season	303	M	7	0.3	1310	50.3	211	8.1	1528	58.7
			F	0	0.0	981	37.6	96	3.7	1078	41.3
			Total	7	0.3	2291	87.9	307	11.8	2606	100.0
2002	8/19, 8/20, 8/22, 8/2	123	M	0	0	1388	69.1	33	1.6	1420	70.7
	(6/23 - 8/25)		F	0	0	506	25.2	81	4.1	588	29.3
			Subtotal	0	0	1894	94.3	114	5.7	2008	100
	8/27 - 8/28	114	M	0	0	523	54.4	34	3.5	556	57.9
	(6/26 - 31)		F	0	0	379	39.5	25	2.6	405	42.1
			Subtotal	0	0	902	93.9	59	6.1	961	100
	9/4 - 9/5	112	M	0	0	417	41.1	18	1.8	435	42.9
	(9/1 - 20)		F	9	0.9	544	53.5	27	2.7	580	57.1
			Subtotal	9	0.9	961	94.6	45	4.5	1015	100
	Season	349	M	0	0	2327	58.4	85	2.1	2412	60.5
			F	9	0.2	1429	35.9	134	3.4	1572	39.5
			Total	9	0.2	3756	94.3	219	5.5	3984	100

Appendix E.6. Historical age and length data for trap caught coho salmon at the Takotna River weir.

Year	Sample Date (Stratum Dates)	Sex		Age Class 1.1 (Age 3)	2.1 (Age 4)	3.1 (Age 5)
2000	8/14 (8/4 - 8/19)	M	Mean Length		541	650
			Std. Error		9	-
			Range		476- 614	650- 650
			Sample Size	0	17	1
		F	Mean Length		535	
			Std. Error		11	
			Range		425- 610	
			Sample Size	0	18	0
	8/25 - 8/27 (8/20 - 8/29)	M	Mean Length		537	506
			Std. Error		5	-
			Range		412- 611	506- 506
			Sample Size	0	74	1
		F	Mean Length		552	543
			Std. Error		3	-
			Range		488- 600	543- 543
			Sample Size	0	76	1
	9/1 - 9/3 (8/30 - 9/7)	M	Mean Length		547	
			Std. Error		6	
			Range		420- 640	
			Sample Size	0	59	0
		F	Mean Length		544	563
			Std. Error		4	13
			Range		435- 594	523- 597
			Sample Size	0	72	5
	9/11 - 9/13 (9/08 - 9/20)	M	Mean Length	573	551	
			Std. Error	-	8	
			Range	573- 573	444- 611	
			Sample Size	1	29	0
		F	Mean Length	571	558	575
			Std. Error	21	5	-
			Range	550- 591	477- 614	575- 575
			Sample Size	2	38	1
	Season	M	Mean Length	573	540	597
			Range	573- 573	412- 640	506- 650
			Sample Size	1	179	2
		F	Mean Length	571	547	557
			Range	550- 591	425- 614	523- 597
			Sample Size	2	204	7

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Appendix E.6. (Page 2 of 4).

Year	Sample Date (Stratum Dates)	Sex		Age Class 1.1 (Age 3)	2.1 (Age 4)	3.1 (Age 5)
2001	8/19, 8/20, 8/24 (7/30 - 8/25)	M	Mean Length	550	566	560
			Std. Error		5	13
			Range	550- 550	475- 635	430- 620
			Sample Size	1	83	15
		F	Mean Length		568	551
			Std. Error		4	7
			Range		505- 620	535- 570
			Sample Size	0	39	4
	8/28, 8/29 (8/26 - 9/1)	M	Mean Length		561	600
			Std. Error		8	17
			Range		395- 640	555- 630
			Sample Size	0	55	4
		F	Mean Length		577	588
			Std. Error		4	14
			Range		500- 635	550- 620
			Sample Size	0	52	6
	9/5, 9/6 (9/2 - 9/20)	M	Mean Length		561	577
			Std. Error		13	15
			Range		440- 640	515- 615
			Sample Size		18	6
		F	Mean Length		566	595
			Std. Error		6	
			Range		515- 605	595- 595
			Sample Size		19	1
	Season	M	Mean Length	550	563	573
			Range	550- 550	395- 640	430- 630
			Sample Size	1	156	25
		F	Mean Length		572	578
			Range		500- 635	535- 620
			Sample Size	0	110	11
2002	8/19, 8/20, 8/22, 8/23 (8/23 - 8/25)	M	Mean Length		530	480
			Std. Error		5	45
			Range		440- 615	435- 525
			Sample Size	0	85	2
		F	Mean Length		564	628
			Std. Error		4	47
			Range		525- 620	536- 810
			Sample Size	0	31	5

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Appendix E.6. (Page 3 of 4).

Year	Sample Date (Stratum Dates)	Sex		Age Class 1.1 (Age 3)	2.1 (Age 4)	3.1 (Age 5)
2002	8/27 - 8/28	M	Mean Length		563	607
(cont.)	(8/26 -8/31)		Std. Error		6	12
			Range		405- 630	580- 635
			Sample Size	0	62	4
		F	Mean Length		570	591
			Std. Error		4	14
			Range		516- 648	567- 615
			Sample Size	0	45	3
	9/4 - 9/5	M	Mean Length		568	550
	(9/1 - 20)		Std. Error		8	40
			Range		405- 660	510- 590
			Sample Size	0	46	2
		F	Mean Length	535	579	591
			Std. Error	-	4	11
			Range	535- 535	500- 650	578- 612
			Sample Size	1	60	3
	Season	M	Mean Length		545	546
			Range		405- 660	435- 635
			Sample Size	0	193	8
		F	Mean Length	535	571	613
			Range	535- 535	500- 650	536- 810
			Sample Size	1	136	11

APPENDIX F
MARK-RECAPTURE TAGGING INFORMATION

Appendix F.1. Tagged chum and coho salmon recaptured at the Takotna River weir, 2002.

Date		Species	Tag Information		Sample	Tagging	Tagging	Travel in	Travel in
Tagged	Recovered		Tag No.	Tag Color	Type	Location	Gear	Days	Miles/Day
6/16	7/4	Chum	15054	Green	ASL	Birch Tree	Wheel	18	20
6/16	7/4	Chum		Green	ASL	Birch Tree	Wheel	18	20
6/18	7/3	Chum	15164	Green	ASL	Birch Tree	Wheel	15	23
6/24	7/9	Chum	15611	Green	E	Birch Tree	Wheel	15	23
							Average	17	21
6/26	7/14	Chum	19056	Blue	E	Kalskag	Drift	18	20
6/27	7/11	Chum	9379	Green	E	Kalskag	Wheel	14	26
							Average	16	23
7/30	9/3	Coho	23681	Green	E	Birch Tree	Wheel	35	10
8/2	9/6	Coho	24549	Green	E	Birch Tree	Wheel	35	10
8/4	8/27	Coho	24742	Green	ASL	Birch Tree	Wheel	23	15
8/6	8/26	Coho	25070	Green	E	Birch Tree	Wheel	20	18
8/6	8/26	Coho	25066	Green	A	Birch Tree	Wheel	20	18
8/7	8/28	Coho	29295	Pink	E	Birch Tree	Wheel	21	17
8/7	8/29	Coho	25471	Green	E	Birch Tree	Wheel	22	16
8/7	8/29	Coho	25462	Green	E	Birch Tree	Wheel	22	16
8/7	9/1	Coho	25241	Green	A	Birch Tree	Wheel	25	14
8/7	9/3	Coho	36096	White	E	Birch Tree	Drift	27	13
8/8	8/26	Coho	25569	Green	A	Birch Tree	Wheel	18	20
8/8	8/28	Coho	25554	Green	ASL	Birch Tree	Wheel	20	18
8/9	9/1	Coho	29773	Pink	E	Birch Tree	Wheel	23	15
8/10	8/30	Coho	36192	White	E	Birch Tree	DGN	20	18
8/11	8/31	Coho	25947	Green	A	Birch Tree	Wheel	20	18
8/12	8/29	Coho	26011	Green	E	Birch Tree	Wheel	17	21
8/12	8/30	Coho	25995	Green	A	Birch Tree	Wheel	18	20
8/12	9/6	Coho	26079	Green	E	Birch Tree	Wheel	25	14
8/13	9/5	Coho	36263	White	ASL	Birch Tree	Drift	23	15
8/14	9/1	Coho	36274	White	E	Birch Tree	Drift	18	20
8/14	9/5	Coho	26332	Green	ASL	Birch Tree	Wheel	22	16
8/15	8/31	Coho	26408	Green	A	Birch Tree	Wheel	16	22
8/15	9/1	Coho	26402	Green	E	Birch Tree	Wheel	16	22
8/16	9/5	Coho	36350	White	ASL	Birch Tree	Drift	20	18
8/17	9/4	Coho	26613	Green	A	Birch Tree	Wheel	18	20
8/17	9/5	Coho	26614	Green	ASL	Birch Tree	Wheel	19	18
8/17	9/7	Coho	26665	Green	E	Birch Tree	Wheel	21	17
8/19	9/3	Coho	26879	Green	A	Birch Tree	Wheel	15	23
8/19	9/7	Coho	26858	Green	E	Birch Tree	Wheel	19	18
8/22	9/9	Coho	35169	White	E	Birch Tree	Drift	18	20
8/26	9/10	Coho	27340	Green	E	Birch Tree	Wheel	15	23

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Appendix F.1. (Page 2 of 2)

Date		Species	Tag Information		Sample	Tagging	Tagging	Travel in	Travel in
Tagged	Recovered		Tag No.	Tag Color	Type	Location	Gear	Days	Miles/Day
8/27	9/8	Coho	35358	White	A	Birch Tree	Drift	12	29
9/3	9/20	Coho	35490	White	E	Birch Tree	Drift	17	21
							Average	21	18
7/28	8/17	Coho	19508	Blue	E	Kalskag	Wheel	20	18
7/30	8/24	Coho	19862	Blue	E	Kalskag	Wheel	25	15
8/5	8/29	Coho	29528	Pink	A	Kalskag	Wheel	24	15
8/7	9/2	Coho	20118	Blue	E	Kalskag	Drift	26	14
8/8	9/3	Coho	20128	Blue	E	Kalskag	Drift	26	14
8/9	8/24	Coho	29881	Pink	A	Kalskag	Wheel	15	24
8/9	9/1	Coho	30095	Pink	E	Kalskag	Wheel	23	16
8/10	9/2	Coho	29121	Pink	E	Kalskag	Wheel	23	16
8/11	9/5	Coho	29919	Pink	A	Kalskag	Wheel	25	15
8/13	8/31	Coho	30089	Pink	E	Kalskag	Wheel	18	20
8/14	9/9	Coho	20218	Blue	E	Kalskag	Drift	26	14
8/16	9/5	Coho	31152	Pink	ASL	Kalskag	Wheel	20	18
8/18	9/5	Coho	31224	Pink	ASL	Kalskag	Wheel	18	20
8/21	9/7	Coho	31363	Pink	A	Kalskag	Wheel	17	22
8/22	9/9	Coho	31455	Pink	A	Kalskag	Wheel	18	20
8/25	9/9	Coho	31837	Pink	E	Kalskag	Wheel	17	22
9/3	9/20	Coho	20464	Blue	E	Kalskag	Drift	17	22
							Average	21	18

ASL = Age, sex, and length sample
A = Actively captured
E = Escapement
Drift = Drift gillnet

Appendix F.2. Chum salmon captured at Birch Tree Crossing and Kalskag by drift gillnet and test fishwheels.

Date	Location	Number Captured	Cum. Captured	Cum. Percent	Location	Number Captured	Cum. Captured	Cum. Percent	Combined Totals Number Captured	Cum. Captured	Cum. Percent
6/14	Birch Tree	3	3	0					3	3	0
6/15	Birch Tree	24	27	0					24	27	0
6/16	Birch Tree	40	67	0					40	67	0
6/17	Birch Tree	68	135	1					68	135	0
6/18	Birch Tree	65	200	1	Kalskag	3	3	0	68	203	1
6/19	Birch Tree	66	266	1	Kalskag	5	8	0	71	274	1
6/20	Birch Tree	54	320	2	Kalskag	21	29	0	75	349	1
6/21	Birch Tree	76	396	2	Kalskag	14	43	0	90	439	2
6/22	Birch Tree	103	499	3	Kalskag	19	62	1	122	561	2
6/23	Birch Tree	141	640	3	Kalskag	92	154	2	233	794	3
6/24	Birch Tree	184	824	4	Kalskag	70	224	3	254	1048	4
6/25	Birch Tree	177	1001	5	Kalskag	59	283	3	236	1284	5
6/26	Birch Tree	181	1182	6	Kalskag	65	348	4	246	1530	5
6/27	Birch Tree	323	1505	8	Kalskag	77	425	5	400	1930	7
6/28	Birch Tree	342	1847	10	Kalskag	74	499	6	416	2346	8
6/29	Birch Tree	347	2194	11	Kalskag	79	578	7	426	2772	10
6/30	Birch Tree	379	2573	13	Kalskag	85	663	8	464	3236	12
7/1	Birch Tree	495	3068	16	Kalskag	94	757	9	589	3825	14
7/2	Birch Tree	575	3643	19	Kalskag	172	929	11	747	4572	16
7/3	Birch Tree	516	4159	22	Kalskag	164	1093	12	680	5252	19
7/4	Birch Tree	674	4833	25	Kalskag	185	1278	15	859	6111	22
7/5	Birch Tree	570	5403	28	Kalskag	316	1594	18	886	6997	25
7/6	Birch Tree	675	6078	31	Kalskag	280	1874	21	955	7952	28
7/7	Birch Tree	738	6816	35	Kalskag	334	2208	25	1072	9024	32
7/8	Birch Tree	788	7604	39	Kalskag	282	2490	28	1070	10094	36
7/9	Birch Tree	583	8187	42	Kalskag	323	2813	32	906	11000	39
7/10	Birch Tree	734	8921	46	Kalskag	342	3155	36	1076	12076	43
7/11	Birch Tree	722	9643	50	Kalskag	323	3478	40	1045	13121	47
7/12	Birch Tree	789	10432	54	Kalskag	294	3772	43	1083	14204	51
7/13	Birch Tree	492	10924	57	Kalskag	259	4031	46	751	14955	53
7/14	Birch Tree	631	11555	60	Kalskag	313	4344	50	944	15899	57
7/15	Birch Tree	488	12043	62	Kalskag	233	4577	52	721	16620	59
7/16	Birch Tree	596	12639	65	Kalskag	241	4818	55	837	17457	62
7/17	Birch Tree	401	13040	67	Kalskag	187	5005	57	588	18045	64
7/18	Birch Tree	423	13463	70	Kalskag	190	5195	59	613	18658	66
7/19	Birch Tree	360	13823	72	Kalskag	405	5600	64	765	19423	69
7/20	Birch Tree	446	14269	74	Kalskag	315	5915	67	761	20184	72
7/21	Birch Tree	665	14934	77	Kalskag	268	6183	70	933	21117	75
7/22	Birch Tree	290	15224	79	Kalskag	180	6363	73	470	21587	77
7/23	Birch Tree	343	15567	81	Kalskag	165	6528	74	508	22095	79
7/24	Birch Tree	211	15778	82	Kalskag	243	6771	77	454	22549	80
7/25	Birch Tree	244	16022	83	Kalskag	223	6994	80	467	23016	82
7/26	Birch Tree	246	16268	84	Kalskag	228	7222	82	474	23490	84
7/27	Birch Tree	348	16616	86	Kalskag	133	7355	84	481	23971	85
7/28	Birch Tree	402	17018	88	Kalskag	116	7471	85	518	24489	87
7/29	Birch Tree	315	17333	90	Kalskag	181	7652	87	496	24985	89
7/30	Birch Tree	195	17528	91	Kalskag	132	7784	89	327	25312	90
7/31	Birch Tree	251	17779	92	Kalskag	174	7958	91	425	25737	92
8/1	Birch Tree	258	18037	93	Kalskag	98	8056	92	356	26093	93
8/2	Birch Tree	226	18263	94	Kalskag	37	8093	92	263	26356	94
8/3	Birch Tree	131	18394	95	Kalskag	45	8138	93	176	26532	94
8/4	Birch Tree	109	18503	96	Kalskag	42	8180	93	151	26683	95
8/5	Birch Tree	124	18627	96	Kalskag	54	8234	94	178	26861	96
8/6	Birch Tree	94	18721	97	Kalskag	80	8314	95	174	27035	96
8/7	Birch Tree	118	18839	97	Kalskag	58	8372	95	176	27211	97
8/8	Birch Tree	80	18919	98	Kalskag	57	8429	96	137	27348	97
8/9	Birch Tree	39	18958	98	Kalskag	35	8464	96	74	27422	98
8/10	Birch Tree	26	18984	98	Kalskag	25	8489	97	51	27473	98
8/11	Birch Tree	23	19007	98	Kalskag	28	8517	97	51	27524	98
8/12	Birch Tree	21	19028	98	Kalskag	15	8532	97	36	27560	98
8/13	Birch Tree	30	19058	99	Kalskag	15	8547	97	45	27605	98
8/14	Birch Tree	23	19081	99	Kalskag	14	8561	98	37	27642	98
8/15	Birch Tree	13	19094	99	Kalskag	8	8569	98	21	27663	98
8/16	Birch Tree	30	19124	99	Kalskag	10	8579	98	40	27703	99

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Date	Location	Number Captured	Cum. Captured	Cum. Percent	Location	Number Captured	Cum. Captured	Cum. Percent	Combined Totals Number Captured	Cum. Captured	Cum. Percent
8/17	Birch Tree	26	19150	99	Kalskag	20	8599	98	46	27749	99
8/18	Birch Tree	30	19180	99	Kalskag	14	8613	98	44	27793	99
8/19	Birch Tree	19	19199	99	Kalskag	16	8629	98	35	27828	99
8/20	Birch Tree	19	19218	99	Kalskag	16	8645	99	35	27863	99
8/21	Birch Tree	16	19234	100	Kalskag	18	8663	99	34	27897	99
8/22	Birch Tree	28	19262	100	Kalskag	20	8683	99	48	27945	99
8/23	Birch Tree	13	19275	100	Kalskag	4	8687	99	17	27962	100
8/24	Birch Tree	5	19280	100	Kalskag	19	8706	99	24	27986	100
8/25	Birch Tree	4	19284	100	Kalskag	11	8717	99	15	28001	100
8/26	Birch Tree	4	19288	100	Kalskag	6	8723	99	10	28011	100
8/27	Birch Tree	3	19291	100	Kalskag	2	8725	99	5	28016	100
8/28	Birch Tree	2	19293	100	Kalskag	9	8734	100	11	28027	100
8/29	Birch Tree	2	19295	100	Kalskag	1	8735	100	3	28030	100
8/30	Birch Tree	5	19300	100	Kalskag	3	8738	100	8	28038	100
8/31	Birch Tree	10	19310	100	Kalskag	6	8744	100	16	28054	100
9/1	Birch Tree	2	19312	100	Kalskag	5	8749	100	7	28061	100
9/2	Birch Tree	1	19313	100	Kalskag	3	8752	100	4	28065	100
9/3	Birch Tree	4	19317	100	Kalskag	3	8755	100	7	28072	100
9/4	Birch Tree	2	19319	100	Kalskag	4	8759	100	6	28078	100
9/5	Birch Tree	3	19322	100	Kalskag	1	8760	100	4	28082	100
9/6			19322	100	Kalskag	3	8763	100	3	28085	100
9/7	Birch Tree	1	19323	100	Kalskag	3	8766	100	4	28089	100
9/8			19323	100	Kalskag	3	8769	100	3	28092	100
9/9	Birch Tree	2	19325	100			8769	100	2	28094	100
9/10	Birch Tree	1	19326	100	Kalskag	2	8771	100	3	28097	100
9/11	Birch Tree	3	19329	100					3	28100	100

Appendix F.3. Coho salmon captured at Birch Tree Crossing and Kalskag by drift gillnet and test fishwheels.

Date	Location	Number Captured	Cum. Captured	Cum. Percent	Location	Number Captured	Cum. Captured	Cum. Percent	Combined Totals Number Captured	Combined Totals Cum. Captured	Combined Totals Cum. Percent
6/28					Kalskag	1	1	0	1	1	0
6/29							1	0	0	1	0
6/30							1	0	0	1	0
7/1							1	0	0	1	0
7/2							1	0	0	1	0
7/3							1	0	0	1	0
7/4							1	0	0	1	0
7/5							1	0	0	1	0
7/6							1	0	0	1	0
7/7							1	0	0	1	0
7/8					Kalskag	1	2	0	1	2	0
7/9							2	0	0	2	0
7/10					Kalskag	2	4	0	2	4	0
7/11					Kalskag	1	5	0	1	5	0
7/12							5	0	0	5	0
7/13	Birch Tree	1	1	0			5	0	1	6	0
7/14			1	0	Kalskag	3	8	0	3	9	0
7/15			1	0			8	0	0	9	0
7/16	Birch Tree	3	4	0			8	0	3	12	0
7/17	Birch Tree	1	5	0			8	0	1	13	0
7/18	Birch Tree	3	8	0	Kalskag	1	9	0	4	17	0
7/19	Birch Tree	2	10	0	Kalskag	6	15	1	8	25	0
7/20	Birch Tree	6	16	0	Kalskag	6	21	1	12	37	0
7/21	Birch Tree	5	21	0	Kalskag	9	30	1	14	51	1
7/22	Birch Tree	5	26	1	Kalskag	5	35	1	10	61	1
7/23	Birch Tree	11	37	1	Kalskag	16	51	2	27	88	1
7/24	Birch Tree	4	41	1	Kalskag	16	67	2	20	108	1
7/25	Birch Tree	14	55	1	Kalskag	19	86	3	33	141	2
7/26	Birch Tree	19	74	2	Kalskag	15	101	3	34	175	2
7/27	Birch Tree	11	85	2	Kalskag	14	115	4	25	200	3
7/28	Birch Tree	21	106	2	Kalskag	23	138	5	44	244	3
7/29	Birch Tree	40	146	3	Kalskag	20	158	5	60	304	4
7/30	Birch Tree	36	182	4	Kalskag	23	181	6	59	363	5
7/31	Birch Tree	49	231	5	Kalskag	50	231	8	99	462	6
8/1	Birch Tree	68	299	7	Kalskag	38	269	9	106	568	8
8/2	Birch Tree	76	375	8	Kalskag	38	307	10	114	682	9
8/3	Birch Tree	67	442	10	Kalskag	44	351	12	111	793	11
8/4	Birch Tree	53	495	11	Kalskag	46	397	13	99	892	12
8/5	Birch Tree	119	614	14	Kalskag	57	454	15	176	1068	14
8/6	Birch Tree	124	738	16	Kalskag	98	552	19	222	1290	17
8/7	Birch Tree	159	897	20	Kalskag	82	634	21	241	1531	21
8/8	Birch Tree	152	1049	23	Kalskag	98	732	25	250	1781	24
8/9	Birch Tree	110	1159	26	Kalskag	80	812	27	190	1971	26
8/10	Birch Tree	119	1278	29	Kalskag	46	858	29	165	2136	29
8/11	Birch Tree	101	1379	31	Kalskag	47	905	31	148	2284	31
8/12	Birch Tree	130	1509	34	Kalskag	46	951	32	176	2460	33
8/13	Birch Tree	136	1645	37	Kalskag	102	1053	36	238	2698	36
8/14	Birch Tree	139	1784	40	Kalskag	68	1121	38	207	2905	39
8/15	Birch Tree	109	1893	42	Kalskag	61	1182	40	170	3075	41
8/16	Birch Tree	146	2039	45	Kalskag	61	1243	42	207	3282	44
8/17	Birch Tree	145	2184	49	Kalskag	62	1305	44	207	3489	47
8/18	Birch Tree	130	2314	52	Kalskag	56	1361	46	186	3675	49
8/19	Birch Tree	147	2461	55	Kalskag	49	1410	48	196	3871	52
8/20	Birch Tree	161	2622	58	Kalskag	76	1486	50	237	4108	55
8/21	Birch Tree	137	2759	62	Kalskag	73	1559	53	210	4318	58
8/22	Birch Tree	183	2942	66	Kalskag	79	1638	55	262	4580	62

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Date	Location	Number Captured	Cum. Captured	Cum. Percent	Location	Number Captured	Cum. Captured	Cum. Percent	Combined Totals		
									Number Captured	Cum. Captured	Cum. Percent
8/23	Birch Tree	160	3102	69	Kalskag	71	1709	58	231	4811	65
8/24	Birch Tree	90	3192	71	Kalskag	111	1820	62	201	5012	67
8/25	Birch Tree	78	3270	73	Kalskag	130	1950	66	208	5220	70
8/26	Birch Tree	88	3358	75	Kalskag	98	2048	69	186	5406	73
8/27	Birch Tree	89	3447	77	Kalskag	102	2150	73	191	5597	75
8/28	Birch Tree	58	3505	78	Kalskag	56	2206	75	114	5711	77
8/29	Birch Tree	51	3556	79	Kalskag	59	2265	77	110	5821	78
8/30	Birch Tree	87	3643	81	Kalskag	72	2337	79	159	5980	80
8/31	Birch Tree	109	3752	84	Kalskag	83	2420	82	192	6172	83
9/1	Birch Tree	120	3872	86	Kalskag	59	2479	84	179	6351	85
9/2	Birch Tree	130	4002	89	Kalskag	98	2577	87	228	6579	88
9/3	Birch Tree	90	4092	91	Kalskag	76	2653	90	166	6745	91
9/4	Birch Tree	99	4191	93	Kalskag	58	2711	92	157	6902	93
9/5	Birch Tree	59	4250	95	Kalskag	67	2778	94	126	7028	94
9/6	Birch Tree	37	4287	96	Kalskag	46	2824	95	83	7111	96
9/7	Birch Tree	49	4336	97	Kalskag	34	2858	97	83	7194	97
9/8	Birch Tree	33	4369	97	Kalskag	42	2900	98	75	7269	98
9/9	Birch Tree	31	4400	98	Kalskag	28	2928	99	59	7328	98
9/10	Birch Tree	31	4431	99	Kalskag	20	2948	100	51	7379	99
9/11	Birch Tree	32	4463	100	Kalskag	11	2959	100	43	7422	100
9/12	Birch Tree	21	4484	100					21	7443	100